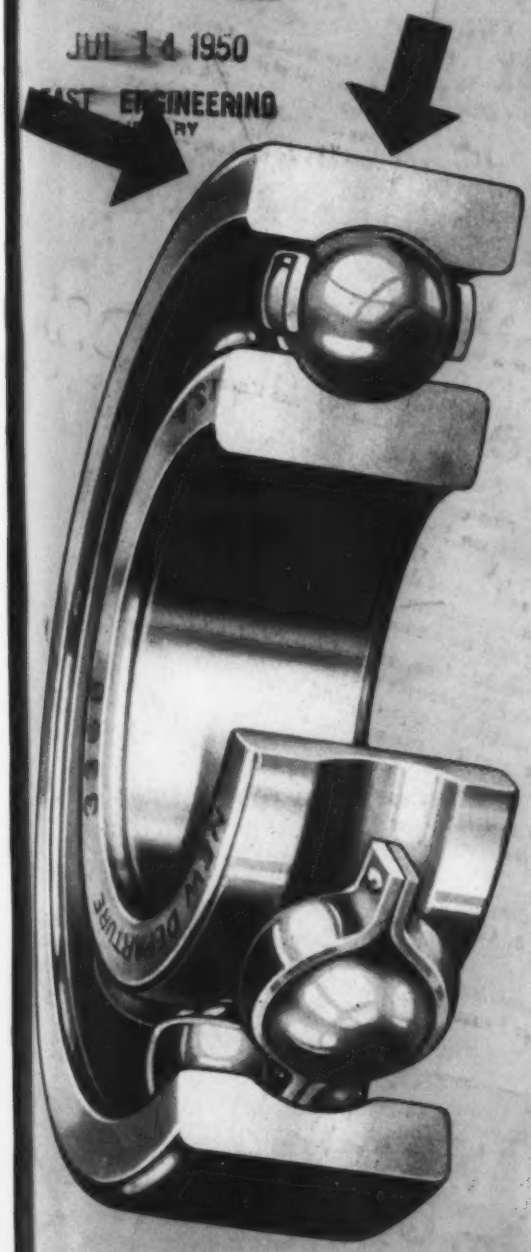
THE IRON AGE

THE NATIONAL METALWORKING WEEKLY July 13, 1950

UNIV. OF MICHIGAN
JUL 14 1950
EAST ENGINEERING



RADIAL LOADS & THRUST from any direction

Taken by ONE SINGLE ROW BALL BEARING

(either sealed-for-life or plain)

One easily applied, unit bearing, requiring no adjustment, provides ideal radial support and axial location in both directions for an infinite variety of shaft mountings. If a ball bearing is used at the other end of the shaft, it floats — takes radial load only. Or the other bearing may be a plain bushing, or any radial, anti-friction type the designer may elect. No headaches over shaft expansion or normal machining errors.

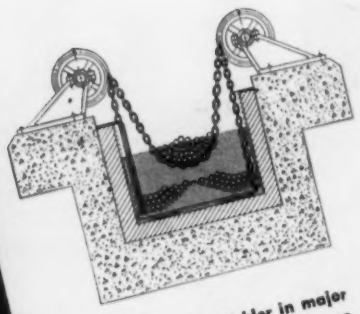
Check into this for greatest simplicity and economy in your designs. The famous New Departure rear wheel bearing* on leading cars is an example. . . . Remember — no other bearing not of dual type or not used in opposed pairs can equal this load service.

**Send for booklet RW showing this application.*

Nothing Rolls Like a Ball

NEW DEPARTURE BALL BEARINGS

NEW DEPARTURE • Division of GENERAL MOTORS CORPORATION • BRISTOL, CONNECTICUT BRANCHES IN ALL PRINCIPAL CITIES



Weldco Mechanical Pickler in major Ohio steel plant, operated with two 600 AT and one 300 AT Cleveland Speed Reducers. Photo by courtesy of Youngstown Welding & Engineering Company.

Unique mechanical bar pickler driven by three CLEVELANDS

THIS pickler descales steel bars prior to cold drawing. The excellence of its work depends on its drive. An unusual arrangement of three Cleveland Worm Gear Speed Reducers lowers and raises the bars in and out of the tank at a prescribed rate, resulting in thoroughly uniform, complete descaling at low cost. No overpickling and no underpickling!

For any job where a powerful, trouble-free, right-angle drive is desired, Cleveland is first choice. Wherever they serve, engineers know from experience that they can depend on Clevelands. They give satisfactory service, no matter how severe the conditions.

Cleveland sales representatives are ready to discuss your power transmission needs with you—help you select correct types and sizes.

For specifications and other details, write for our current catalog. The Cleveland Worm & Gear Company, 3252 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

Excessive deadweight is sheer waste–

reduce it with MAYARI R

Why build unnecessary deadweight into a truck body when it only increases the cost of operating the vehicle? It's good business to cut surplus deadweight when you can do it with a moderately priced, low-alloy, high-strength steel like Mayari R.

Because its yield point is almost double that of plain carbon steel, Mayari R can be used in lighter gages with considerably higher unit stresses. Strength is not sacrificed.

Because it has 5 to 6 times greater resistance to atmospheric corrosion, thinner sections of Mayari R will outlast heavier sections of carbon steel. Service life is not reduced.

The cost of fabricating and welding Mayari R is generally the same as for ordinary steel. The usual methods and equipment are used with only slight allowances needed for its higher properties.

Further information on the applications of this superior grade of steel is readily available at any of our sales offices. Ask for a copy of Mayari R catalog No. 259.

⌂ By building the body and cab shield of this dump truck from 10 gage Mayari R instead of 8 gage carbon steel several hundred pounds of surplus deadweight were eliminated. The body was fabricated by American Sheet Metal Works, Portland, Oregon, and assembled by Newell Truck Equipment Co. of Portland.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

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Mayari R *makes it lighter... stronger... longer lasting*

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THE IRON AGE

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JULY 13, 1950 • • • VOL. 166, No. 2

Special Article

Improved quality and lower costs have resulted from Pratt & Whitney Aircraft's wartime experience and postwar developments in barrel finishing. Small quantities of a wide variety of parts are now being processed. Experience has shown how to control the many variables.—p. 81.

Issue Highlights

Industry faces new restrictions in the form of gas, dust, and fume ordinances. Simple techniques for evaluating atmospheric pollution are necessary. Stack sampling is one approach to the problem that is now being given industry consideration. Two articles reveal the extent of nationwide pollution and evaluate the stack sampling technique.—p. 84.

Small amounts of noble metal addition agents in the few practical acid electroplating baths create many new alloy compositions and permit new control methods. Acid solutions operate at higher electrode efficiencies and are not subject to typical alkaline decomposition.—p. 92.

The Commerce Dept. is preparing to form a new iron and steel industry advisory committee. Other committees in such fields as machine tools and machinery will be set up in the very near future. Disturbed over shortage complaints, Commerce Dept. may ask for voluntary allocations. —p. 103.

Shipments of nickel to customers will be reduced during the last half of the year by voluntary action of International Nickel Co. Buyers are reported to be offering premiums above quoted prices. Stainless steel producers are making every effort to get customers to return scrap containing nickel.—p. 104.

Recent rail rate reductions have regained some business for the railroads, but not nearly as much as had been expected. Rail officials are still optimistic; they think it might be too early for the full effect of the changes to show. —p. 105.

Coming Next Week

A single sample method for analysis of manganese bronze saves time, reagents and apparatus. Percentages of tin, lead, copper, iron, manganese, nickel, aluminum and zinc in samples can be accurately determined. Article outlines step-by-step procedure to be followed.

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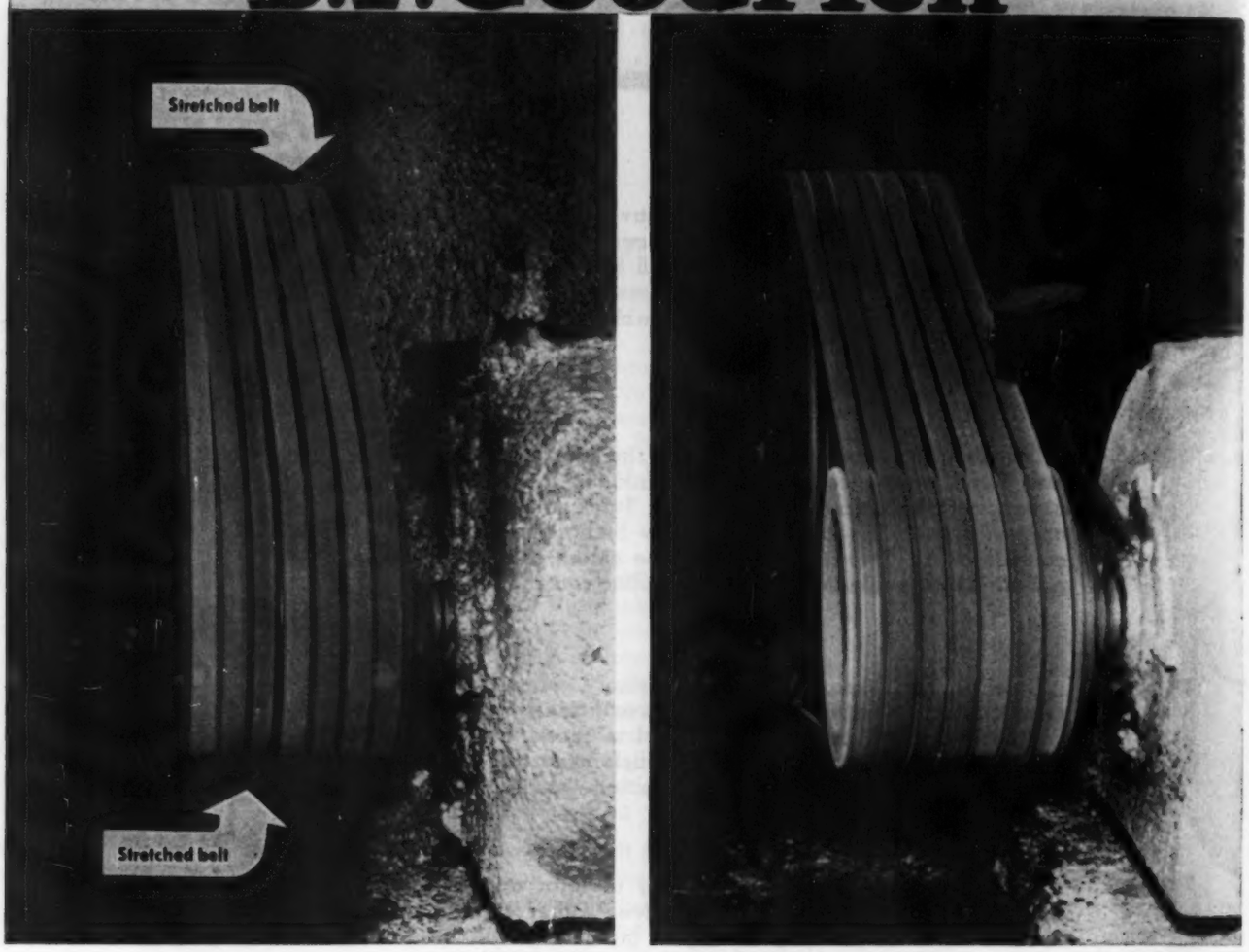
B.F.Goodrich



One of these drives is wasting money — the other has grommet V belts

B.F.Goodrich grommet V belts cut costs 20 to 50%

BOTH of these drives are in the same plant, do the same work, get the same maintenance. When first installed both were equipped with ordinary belts. But within a few days the belts had stretched so much the motor had been moved to the end of the slide rails. Ordinary belts were tried again, but they still stretched, even more so. The photo at *left* shows how the belts looked — loose, permanently stretched, over-riding each other.

Then B.F.Goodrich grommet V belts were put on both drives. After six months of 24-hour-a-day service, they haven't stretched at all, as the photo at right shows. Here are the reasons:

Twin grommets — The B. F. Goodrich grommet is made by winding heavy cord upon itself to form an endless loop. These grommets are placed close to the driving faces of the belt, make up the load-carrying section. No fabric plies to stiffen and build up heat. The B. F. Goodrich grommet V belt is more elastic, has less permanent stretch than any other V belt.

Grommets work all the time — In an ordinary belt much of the cord strength is lost, wasted in the center of the belt where the cords don't pull their share of the load. But in the grommet belt there are no center cords to loaf. The grommets do the work, stay at it all the time.

Grommets last longer — Laboratory and field tests show grommet V belts last 20 to 50% longer. Cause of most belt failures is eliminated by the grommets that replace overlapping cord plies.

The twin grommet construction is a result of B. F. Goodrich research (U.S. Patent No. 2,233,294). No other V belt is a grommet V belt. Presently made in D and E sections only.

A special demonstrator "X-ray" belt has been made to show the grommet construction. Ask your local BFG distributor to bring it around. *The B.F.Goodrich Company, Industrial and General Products Division, Akron, O.*

Grommet V Belts BY

B.F.Goodrich

Editorial

INDUSTRY VIEWPOINTS

Let's Call A Halt

YOU all know that it has been fashionable during the past few years to haul businessmen off to Washington for questioning—be it about big business, small business, prices or what have you.

Much of the questioning has been unfair. Many of the hearings have had the scent of a political sounding board. The costs to companies and their people have been enormous. Much of the inquisitioning has not been for the basic interest of the people.

Some businessmen have been to these stage settings so often that they could be truly called troupers. But even troupers get tired of the same thing. Especially when little or no attention is paid to what they say.

The international situation is loaded with dynamite. We are in the midst of telling the world that we believe in freedom—so strongly that we will fight for it. Now is the time when government and industry need solidarity to face the world on important decisions.

We cannot have this solidarity if the home front is kept in an uproar with campaigns against business. We do not mean that there should be no just and honest criticism from both sides, even during the present crisis. But we do mean congressmen could do a better job for their people if they laid down those scripts which seem to say that business is always wrong.

Industry must share a big part of the responsibility for making this country stronger. But it can't do a proper job if it is harassed and badgered by hearings, long questionnaires and continuous harpooning.

Government and administration people have their responsibility, too, in this latest cold war crisis. Let them live up to it.

Now is the best time in the world to call a halt to useless blind-alley hearings in Washington. Let's get on with strengthening this country without internal bickering that does only harm to all of us.

Tom C. Campbell

Editor

NOW.....

For services where an explosion-proof motor is required you can now have all the advantages of Crocker-Wheeler's dollar-saving SEALEDPOWER design . . .

Now, for refineries, chemical plants, grain elevators—wherever explosions are a hazard—Crocker-Wheeler offers an Explosion Proof Sealedpower Motor incorporating every wanted feature of the original "maintenance miser," the standard totally-enclosed, fan-cooled Sealedpower.

Here is the same finned frame construction that identifies a Sealedpower Motor . . . the same exterior cooling (dust and fumes are carried *outside* and *away*) . . . the same maintenance *saving*—80% and more!

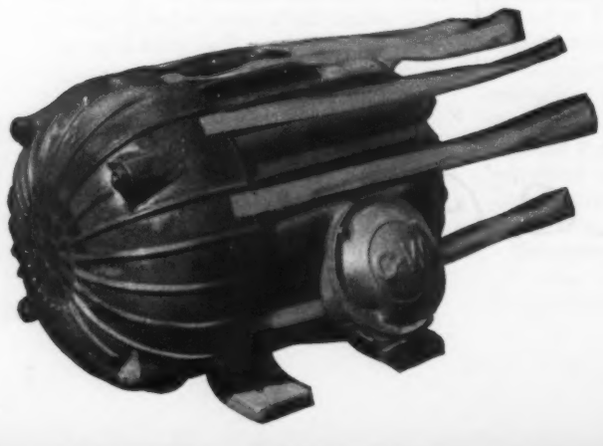
Available in NEMA frames 364-505, Crocker-Wheeler Explosion Proof Form CFC Motors are approved by the Underwriters' Laboratories for Class I, Group D, and Class II, Group F and G locations.

Before you buy any totally-enclosed, fan-cooled motor, compare it with the cool-running, efficient, maintenance-saving Sealedpower Motor. You'll find there's no other motor to match it. Send today for new Bulletin SL-300-5. Simply mail coupon on opposite page.

BEATS RUST AND CORROSION The stator frame, end shields, and cowl are rugged gray iron castings. Extra long metal-to-metal fits between end shields and frame provide flameproof seal. The close-running, long clearances between bearing housings and shaft more than meet all safety requirements.

SAFE AUTOMATIC DRAINAGE Threaded drain plugs afford sufficient clearance for automatic drainage of condensate, as well as a long flame path for adequate protection. Drain plugs are cleaned simply by turning the labyrinth member, which is kept in the plug at all times by a limit stop.

NO LUBRICATION NEEDED You can install a Crocker-Wheeler Explosion Proof Motor and forget it. The double-row-width sealed bearings are pre-lubricated . . . need no attention for at least five years. Bearings prepacked with extra large supply of stability-tested grease.



DAMAGING DUST AND FUMES ARE BLOWN OUTSIDE AND AWAY!

Like the standard Sealedpower Motor (left), Crocker-Wheeler's Explosion Proof Sealedpower Motor also cleans itself! Here fluttering streamers trace the fan-driven airstream that blows dust and fumes *outside* and *away*. The radiating outside fins provide over 150% more cooling surface! With no internal passages to clog, cause over-heating, and necessitate disassembly for cleaning, C-W Explosion Proof Sealedpower Motors cut maintenance costs as much as 80%.

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► New metal hot tops have been developed for small ingots 6 x 6 in. and under. The tops are finned and no ingot discard is reported when using these tops.

► Recent research shows that in order to work pure vanadium an elongated grain structure is necessary. Equiaxed grain structures are brittle. Correct microstructure for the best ductility of this metal is therefore very similar to that of tungsten and molybdenum.

► Workers are suffering practically no heat cramp cases this year. Although salt tablets continue to be used, this may not be the complete answer. Part of the answer may be better restaurant facilities and canteens. Menus are well balanced. This is quite different from the old days of heavy lunches and continuous piecing from the lunch box.

► In steel and other metals where aluminum and titanium enter into age hardening reactions, vacuum or inert atmosphere annealing is mandatory. Regular annealing permits too much nitrogen absorption which forms aluminum and titanium nitrides and precludes aging. This is particularly apparent in thin sections.

► Labor savings of 15 pct in loading and unloading trucks and vans have resulted from the installation of hydraulically operated loading ramps at the Naval Supply Center, Norfolk, Va. Formerly used metal plates have been discarded. Various sized ramps are operated by hydraulic rams driven by electric motors.

► A cutlery manufacturer is conducting continuing experiments with stainless steel in an attempt to put out a line of cutlery that will be made of stainless but have the appearance of silverware. Good results are reported from a combination of etching and polishing.

► A manufacturer of control units is looking into the possibility of using titanium for magnetic amplifier boxes. Reason: Increasing size of units makes lighter weight necessary.

► An auto manufacturer has replaced the painted steel garnish molding in all of its inner doors with plated aluminum die castings. Advantages include (1) elimination of welding, (2) better fit, (3) fewer screws, and (4) greater rigidity from a design that could not be made economically out of steel stampings.

► The R value method of evaluating deep drawing quality sheets by comparing mill tests against front fender drawing performance shows excellent correlation. Big problem still facing the mills is to learn how to consistently control the process variables affecting R values. The precise variables have yet to be determined.

► A fluid valve containing a polyethylene plastic diaphragm has been developed to handle concentrated sulfuric acid and other highly corrosive liquids. Maintenance problems are claimed to be reduced.

► Landing problems in confined or rough terrain may be solved by rocket-propelled anchors which consist of a 28-in. steel tube 1 3/8 in. in diam. filled with rocket propellant. They may be fired 18 in. into the ground at a 45° angle by a glider or small plane. Shock is absorbed by 200 ft of stainless steel tape wound on a hydraulic brake.

some things need experience

Putting stainless steel to work in a given application requires experience. Since stainless is a whole family of steels, the *right* analysis must be used . . . or stainless steel will not function properly. That's why Crucible, pioneer in the development of this specialty, offers you, freely, the experience of an alert metallurgical staff. These engineers and metallurgists know which stainless fits your job best . . . and their advice can save you time and money in applying stainless steel to your requirements.

The painstaking care Crucible shows in finding the best answer to Industry-posed problems is the measure of Crucible's half century of specialty steel leadership. Put this experience to work for you. And, whether the order is in tons or pounds, your problem is assured prompt attention. When it's stainless...call in Crucible. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

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Voluntary Allocations Ahead

Consumers Scramble for Steel

Steel Operations at 96.5 Pct

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

PLANS are under way this week to back the United Nations fight in Korea with the biggest steel potential in the history of the world. While the industry will be able to take care of unprecedented domestic demand, there will be no hesitation to sidetrack such orders for military needs when and if the word is given.

A new voluntary allocations plan for the steel industry is likely in the very near future. It has been learned that the Commerce Dept. is preparing to form an iron and steel industry advisory committee—possibly this week. This committee will be composed of men responsible for production, distribution, transportation and raw materials. It will work closely with Government officials to insure speedy action on military orders and fair distribution of tonnage available for non-military uses.

War goods include a great deal more than guns, tanks planes and ammunition. Orders for freight cars, trucks and trailers, pipelines, lockers and many other items will also be turned out ahead of civilian goods. Now revived is a program for 100,000 freight cars which would require 2.3 million tons of steel. And pushing ahead orders for such items as jeeps, trailers and air corps lockers will require speedy channeling of supplies.

Careful Ordering Needed

Orders for this type of goods will place even greater demand on plates and hot and cold-rolled sheets—items which are already high on the scarce list. As long as the Military holds strict control over its many departments in ordering steel for preferential needs there will be no trouble. But if past mistakes are repeated priorities, written carte blanche, will tangle the lines of steel distribution.

As it affects industry, the military problem now is four-part: (1) To replace battle material and equipment lost in Korea; (2) to replace material shipped from the U. S.; (3) to build new material for Korea and the U. S.; (4) to carry out the provisions of the Atlantic Charter. If within the next 3 months voluntary methods of doing this do not prove effective we may see a return of the controlled materials plan—CMP—requirements matched against available supplies.

Users Scramble for Steel

It is the type rather than the tonnage of military steel that could cause confusion. No matter what the type or tonnage given the preferential tag it must be gotten out ahead of everything else. Such a situation could mean a jimmying up of domestic requirements and production.

Recognizing this, steel users this week are climbing all over themselves to get all the steel they can. Whether they can get more than they have been getting is unlikely, but that won't stop them from trying. Consumers who normally use carbon steel are now trying to get alloy. They are only partly successful. Alloy producers, booked solid through the third quarter in the West, are taking orders for October delivery. The situation is softer in the East, but tightening fast.

Hot-rolled bar producers are theoretically booked up solid indefinitely, although demand is more flexible in the East. Makers of silicon steel are booked solid through the third quarter and are taking orders for October delivery.

Since International Nickel Co. has decided on voluntary allocation of nickel during the second half of the year stainless steel producers face a tough battle in their efforts to catch up on deliveries. Stainless steel scrap recovery plans which have been in effect for 2 or 3 months will now be stepped up in an effort to quickly reclaim every available pound of nickel.

Ingot Rate at 96.5 Pct

Steelmaking operations this week are scheduled at 96.5 pct of rated capacity, having rebounded 3.5 pct from the holiday week's revised rate of 93. The steel companies are hard hit by vacations but are doing everything they can to turn out every ton of steel possible. They know that every extra ton will ease the pressure a bit more.

(Nonferrous summary, p. 128)

Close-up of Gas-fired ceramic burners arranged to provide instant heat at all points on the face of the gear. Note that larger or smaller gears can be heat-treated on the same unit by increasing or decreasing the number of burner units.

Photos courtesy Gas Appliance Service, Inc., Chicago, Illinois

METHODS EMPLOYED IN HEAT-TREATING GEARS EMPHASIZE SPEED AND ECONOMY OF GAS

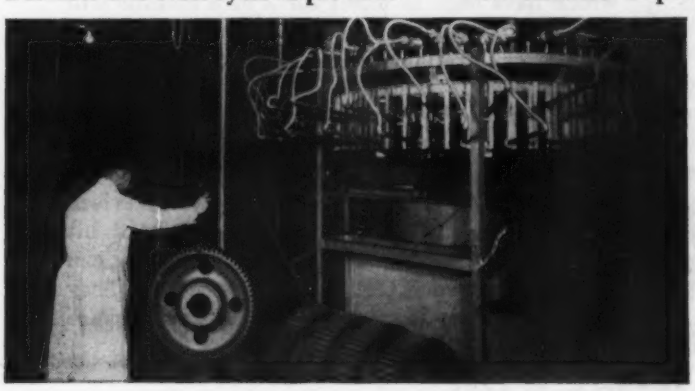
CASE HARDENING by the direct flame method is one of the many applications in which GAS has demonstrated its capacity as a production tool with all the advantages of speed, controllability and economy.

An outstanding dollars-and-cents example of the efficient utilization of GAS in heat-processing is to be found at Gas Appliance Service, Inc., Chicago. Gears for heavy machinery are flame-hardened by spinning them within a circle of high-velocity GAS burners. The total cycle of pre-heating, soaking, final heating, quenching and flame drawing requires ten minutes on a 400-lb., 28-inch diameter gear for use on a mine locomotive.

The speed of GAS is demonstrated by the fact that the high-heat part of the cycle requires only two minutes. And this contributes materially to cost-cutting in the production-line because the total primary cost for GAS and labor in heat-treating is less than one-quarter cent per pound of steel treated.

Of extreme importance in any heat-treating operation is the flexibility of equipment. In this alone GAS has many advantages over other types of fuel—advantages such as the simplicity of the machinery, accuracy of the automatic GAS controls, small initial investment in equipment which can be used for a wide variety of operations without special accessories.

These are important reasons for any manufacturer, or any machine shop operator, who must perform miscellaneous heat-treating tasks. Your local Gas Company Representative can help you do them economically.

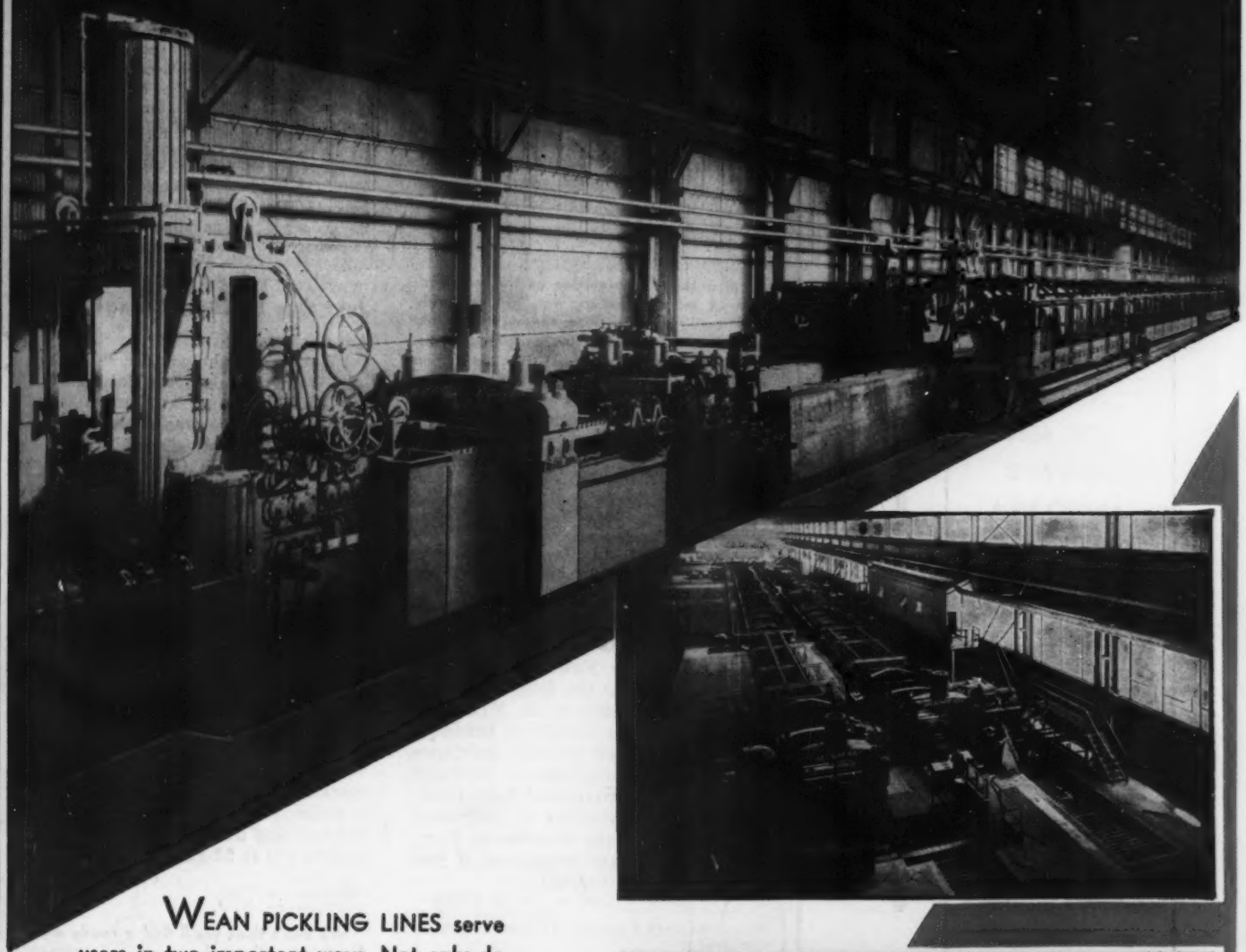


The complete flame-hardening unit in which gears and other round metal parts are heat-treated.

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

WEAN PICKLING Equipment



WEAN PICKLING LINES serve users in two important ways. Not only do they assure a better — more uniform — pickling job — but the job is done more economically and profitably.

That's why today the majority of steel makers think of Wean when it comes to sturdy, efficient, high production pickling equipment.

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SPECIALISTS IN SHEET, STRIP AND TIN MILL EQUIPMENT

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AVAILABLE FOR IMMEDIATE SHIPMENT FROM OUR CHICAGO WAREHOUSE.

SPECIFICATIONS

AMS 6260
AMS 6270
AMS 6272
AMS 6280
AN-S-14A
AMS 6324
AMS 6415
AN-QQ-756A
AMS 6320 (Hex)

ROUNDS—HEXAGONS
COLD DRAWN
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WE SEND A CERTIFIED ANALYSIS WITH EVERY AIRCRAFT SHIPMENT, AND THE RESULTS OF JOMINY HARDENABILITY TESTS WHERE NECESSARY.

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Dear Editor

Letters from Readers

Read Far and Wide

Sir:

There were many interesting articles in the April 20 issue on powder metallurgy, but none was on powder manufacturing processes.

I will be highly thankful if you will kindly supply me a detailed account of the metal powder manufacturing processes, especially of iron, copper, and aluminum.

PREMNATH
Bombay, India

For detailed information on the manufacture of metal powders, you will probably find more information in the several books on the process than in the periodical press. Most books deal with both the production and use of metal powders, thus giving a complete picture. The following books may be pertinent: "Powder Metallurgy" edited by John Wulff, American Society for Metals, 7301 Euclid Ave., Cleveland, Ohio, $7.50. "Powder Metallurgy—Its Physics & Production" by Paul Schwarykopf, The MacMillan Co., New York, 1947. "Treatise on Powder Metallurgy" by Claus G. Coetzel, Vol. I—Technology of Metal Powders and Their Products, Interscience Publishers, New York, 1949. $15.00.—Ed.

Makes a Difference

I note on the Newsfront page of the June 15 issue the following item: "Recent investigations at MIT indicate that metallic structures produced by hardening show greater resistance to fatigue than comparable hardness produced by conventional heat treatment." This statement is not clear to any of us in the Metallurgy Dept. at MIT and I am wondering if you would clarify it further.

C. F. FLOE
Executive Officer
Massachusetts Institute of Technology
Cambridge

We are not surprised that the entire Metallurgy Dept. at MIT could not figure out the newsfront in our June 15 issue. Trouble is, one word fell out of that item. If you will add the word "work" so that it reads " . . . structures produced by work hardening . . . " it will make sense. We are sorry about this and hope it has caused no embarrassment to your dept.—Ed.

For Bluer Italian Skies

Sir:

We saw in the issue of Jan. 5 your summary on air pollution regulations and remedies. As we are interested in this matter, we would very much appreciate if you could send us further bibliographic data, if possible, about the corresponding English laws and about the technical solutions of this problem used in U.S.A. as well as in England with special concern to domestic heating plants. We would also be grateful if you could explain to us how the different densities of smoke are judged and compared.

L. ERIZZO
Techint
Milan, Italy

Bibliographies on this subject were prepared by Mr. Leslie Silverman, Associate Professor of Industrial Hygiene, School of Public Health, Harvard University, and Mr. Henry F. Hebley, Research Consultant, Pittsburgh Consolidation Coal Co., Pittsburgh.

With regard to the measurement of pollution, you may wish to secure the publication of the U. S. Bureau of Mines, Washington 25, D. C., entitled "Standard Methods for Measuring Extent of Atmospheric Pollution," by C. Brown and H. H. Schrenk. This publication carries the designation I.C. 7210 (May 1942). A forthcoming issue of THE IRON AGE will carry an extensive discussion of air pollution regulations and remedies by Messrs. Silverman and Hebley. —Ed.

Just One of Those Things

Sir:

I have seen the article, "Galvanizing Water Tanks At Hotpoint," in the June 15 issue, and am sorry to report that there was a slip-up made regarding the author's affiliation. Mr. John Wallerius is Chief Engineer of the Sunbeam Stewart Industrial Furnace Div., Sunbeam Corp., Chicago. He is not connected in any way with Hot Point Water Heater Div., Milwaukee.

R. M. KENUTIS
Advertising Dept.
Sunbeam Corp.
Chicago

Scrap Inquiry

Sir:

In your magazine, there is a list of scrap iron and steel market prices. Where in this list would we find the market price of the following:

Bales consisting of 0.25 electrolytic tinplate and black iron of 90 to 107-lb weight (30 to 32-gage).

CLARK DECH
Canister Co., Inc.
Phillipsburg, N. J.

We don't think you'll find a ready market for this bundle and suggest you segregate the black sheets from the tinplate. Sell the former through regular scrap channels, the latter to a detinning company.—Ed.

Pleased With Article

Sir:

We were very pleased with the article in the June 15 issue entitled "Rheem Forms 55-Gallon Drums After Color Lithography," and would appreciate your sending us 12 additional copies of this article.

J. T. KANE
Asst. Plant Manager
Rheem Mfg. Co.
Bayonne, N. J.

Glad you liked the presentation; the copies requested have been sent.—Ed.

'Surface' HNX

CONTROLLED ATMOSPHERE

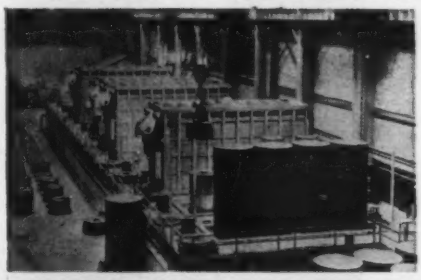
IMPROVES ANNEALING PRACTICE . . . PERMITS HIGHER STANDARD OF QUALITY IN STEEL MILL PRODUCTS

● HNX Controlled Atmosphere Gas is the newest modification of NX Gas and represents another step forward in research and development in controlled atmospheres for the processing of steel mill products. It is finding many applications where process requirements demand an inexpensive hydrogen-nitrogen protective atmosphere to assure top standards of quality.

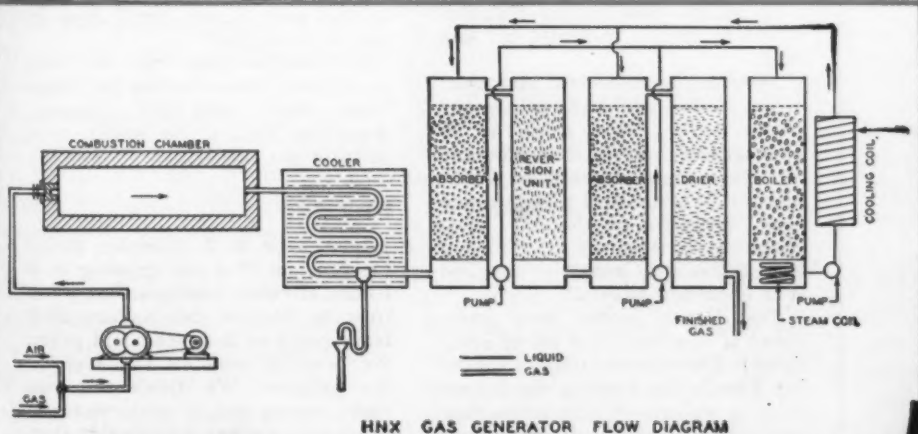
Present applications of HNX Gas for the annealing of tin-plate stock have proved this atmosphere superior to others previously used, making possible a tin-plate stock of improved corrosion resistance. Eliminates "borders".

HNX Gas is not explosive and therefore serves as an excellent purge gas. At conventional mild steel annealing temperatures of 1150°F. to 1300°F. it provides complete surface protection for the steel when applied in the cover-type annealing furnace.

Invite a 'Surface' Engineer in for complete details.



Battery of 'Surface' lift-type annealing covers in a leading steel mill now using HNX gas for coil annealing.



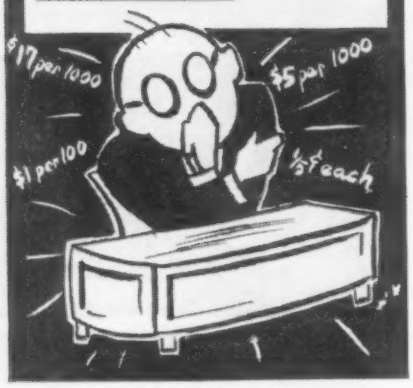
HNX GAS GENERATOR FLOW DIAGRAM

TYPICAL HNX GAS ANALYSIS

CO_2	Trace
CO	Trace
CH_4	Trace
H_2O	Dewpoint: (minus 40°F.)
H_2	3.0 to 10.0% (adjustable as required)
N_2	Remainder

'Surface' SERVES THE STEEL INDUSTRY

Do you know how much the springs you buy actually cost?



WHEN you calculate the cost of your springs, don't stop with the price billed by your springmaker. Get the whole picture by taking into consideration *all* the costs . . . the inspections necessary . . . the delays caused by rejects . . . the hitches in your assembly resulting from spring imperfections. With this data at hand your spring costs may take on an entirely different character.

Take the case of a small spring which previously required two operations in manufacture, one by machine and one by hand, followed by careful inspection and a high rate of rejection. Accurate's skilled springmakers developed the tooling necessary to produce this spring in one machine operation with unvarying accuracy. Unit cost was substantially reduced, inspection and rejects were eliminated. The combination of all these savings was mighty important.

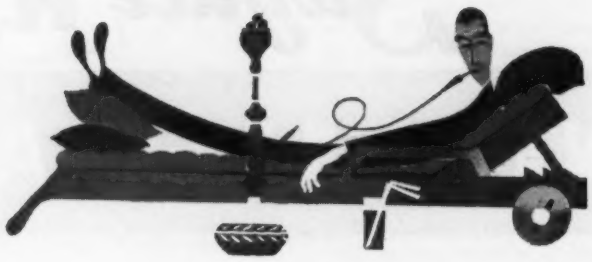
Why not let Accurate engineers appraise your spring requirements . . . the chances are they can cut the overall cost of your springs. Write today.

Accurate Springs

A dependable source of supply!

ACCURATE SPRING MFG. CO.
3819 W. Lake St. • Chicago 24, Ill.

Springs, Wire Forms, Stampings



Fatigue Cracks

By CHARLES T. POST

Food for Thought

Every man has his vices, but the constant intellectual demands on George Elwers, the machinery editor, rule out such normal ones as tobacco, liquor, and women to any great degree. Elwers is too busy working. He has found that the only vice—if it be such—compatible with his work is the rapid fire consumption of Necco wafers, those thin little sugar candies.

As Rosalie Benedetto, his faithful girl Friday, wrote to the Necco people, "It is hard to say just how many he eats a day or week. I guess he'd eat as many as I could or would bring for him. As it goes now, I usually bring five packages every other day or so. The eating starts promptly in the morning when he sits down to his desk and seems to go on endlessly all day long.

"One day he mentioned that when he got rich he was going to see that Necco wafers were made up in packages of just all chocolate and all green ones (whatever flavor that is). Whereupon I piped up and said I could get all chocolate ones. Since then one of my most important duties is to keep him supplied with chocolate Neccos."

The Necco people were overjoyed at this impulsive bit of intelligence. They lost no time in thanking Rosalie for keeping the Necco-chief in wafers. What's more, they said, they did make all green ones as well as all chocolate, and they were sending along a big box of them with their compliments.

When the box came in, Rosalie had to confess that she was responsible for revealing the boss' secret vice to the fountainhead from which all Neccos flow. Elwers didn't get mad. He reflected a minute as he slipped a chocolate Necco back and forth under his tongue, the big box open in front of him.

"Say," he mused, "did you ever write to the Ford Motor Co. and tell them how wonderful I think my Ford is?"

They're All Ages

When they're introduced to Bill Seegan, not all the metalworking executives he meets realize immediately that he is the man shown on your favorite family journal's masthead and on his calling cards as "W. Czygan, Associate Editor."

The other day he stopped in to see the head of a big New England metal parts plant, handed over his calling card. The official glanced at it, then settled down for a long and informative interview. As Bill rose to leave, the man held out his hand, smiled, and said, "I can't tell you how much I've enjoyed talking to you, Mr. Age. Next time you're up this way, I hope you'll drop in and see us again."

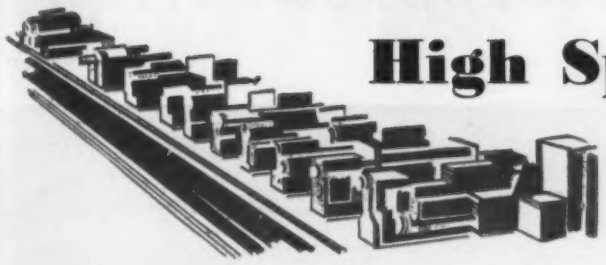
Bill realized then that the most prominent letters on his card say, "IRON AGE" with "W. Czygan, Associate Editor" in small type down in one corner.

Puzzler

Last week E. J. Sampson posed the problem of a cow grazing in a 1-acre circular pasture, tied by a rope to one of the surrounding fence posts so that she could graze over exactly one-half the area of the pasture. We didn't tell you right away, but if you want to check your answer, he revealed that the rope was exactly 115.87 ft long.

That makes appropriate the comment of J. Charbonnier, Angouleme, France, who says he is "in charge of filing the technical articles from IRON AGE for the French Navy and reading Fatigue Cracks for his own pleasure." Submitting the correct answer to some previous puzzlers, he writes, "I equally enjoyed the problem of the grazing cow . . . but by G-d, why don't those damned cows use the metric system!"

MACHINE TOOL High Spots



Sales Inquiries and Production

By W. A. LLOYD

Pondering on Korea—Like many other strategic industries, machine tool builders were carefully weighing possible effects of the Korean situation this week.

Spokesmen for major segments of the industry cautioned that it is too early for any concrete appraisal, but at the moment the following developments seem rather likely.

No immediate increase in new order volume unless the government decides to broaden its buying.

Insertion of escalator clauses in contracts, to protect producers against a sudden rise in costs.

Building for inventory. This is already under discussion in some companies, and the chances are that it will start with building of certain strategic machine tool parts, or assemblies for inventory (a real ace in the hole in case of total war).

May be Meaningless — In Detroit, two theories circulate as to the possible effect of the Korean situation: first that hostilities abroad will encourage auto manufacturers to rush in with new tooling orders so as to be at the head of the list, in case that means anything. According to some sources, there is evidence that this has already happened.

The second theory holds that large-scale warfare will automatically mean that national defense will have top priority and auto company orders will be meaningless.

Emergency Planning — Local machine tool suppliers in Detroit indicate that there have been no orders from Washington that will curtail the buying of machine tools for the auto industry at present.

However, most sources agree this situation could change very fast at which time it will be disclosed that a considerable amount of advance planning has already gone into tooling developments for a national emergency.

Better Business Seen — But apart from the Korean situation, it appears this week that the industry will have better business in the 6 months ahead than it has had for quite a while.

Companies that were in stock condition 3 months ago are quoting on a 60-day basis, and scattered reports indicate that June business topped the May peak.

Expansion Drawback — Despite this improvement, the machine tool industry is not booming. Business is spotty, as it has been since the end of the war, primarily because the nation is not in the throes of a big industrial expansion, and machine tool builders are dependent to a greater extent than ever before on the replacement market. Relatively few industries are expanding and their machine tool requirements do not involve the industry as a whole.

Initial Impetus—For the past 5 months, the industry has been shipping at the rate of a $300 million year. It is likely that 1950 would have easily topped $300 million in shipments had more companies had enough backlog to get off to a big start in the early months.

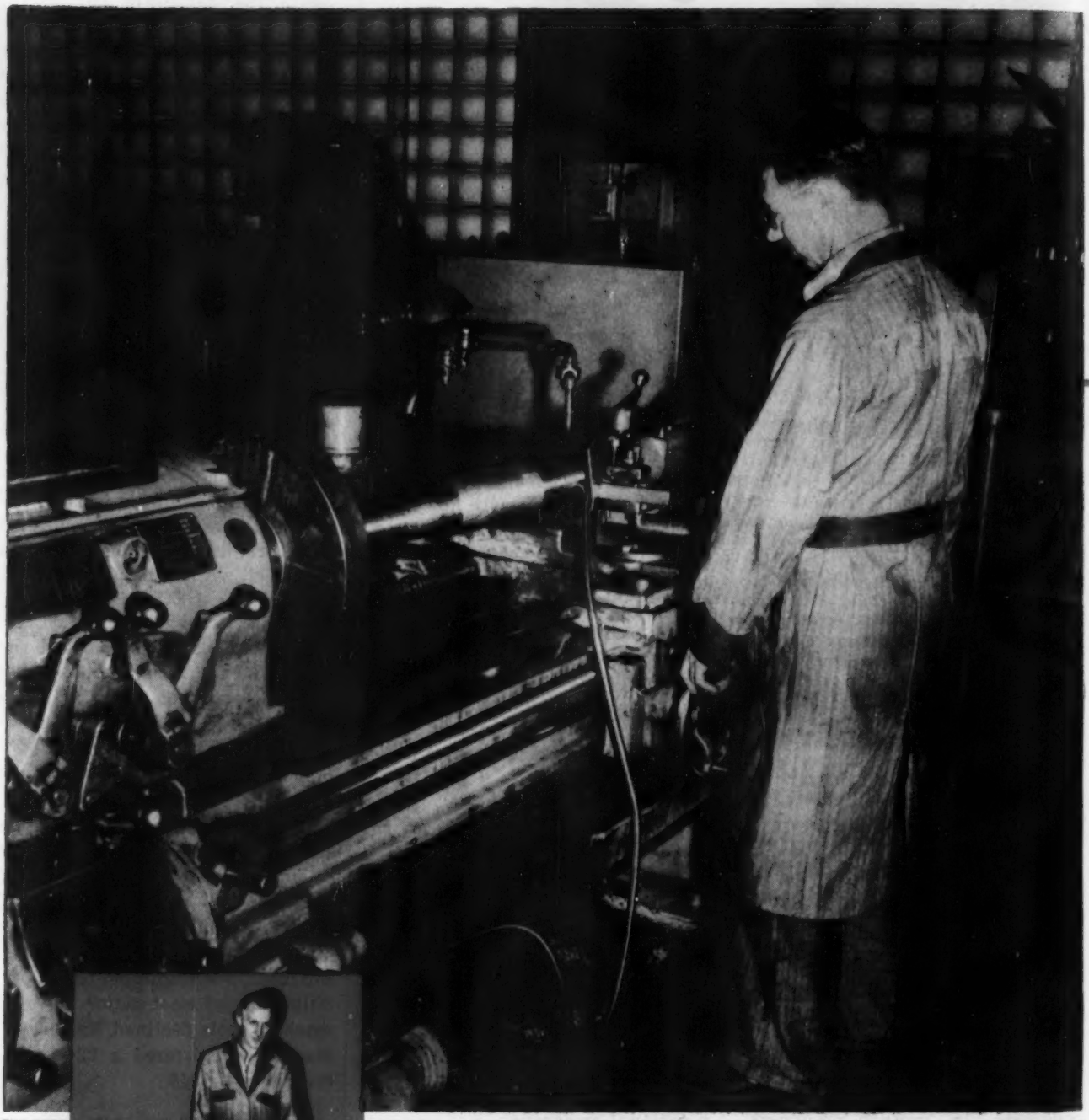
Meanwhile, a round of price increases in machine tools is on the way. The trade has been notified of several increases, some as much as 15 pct, within the past 10 days.

Decline from '48—In Washington, the Industry Division of the Bureau of the Census released its annual report on machine tools showing that 349 companies shipped machine tools valued at $241 million in 1949, a 13 pct decline from 1948.

The report also showed that in shipments by states, Ohio ranked first with $82 million, one third of the U. S. total. Of total value of 1949 shipments, lathes, grinding and polishing machines and milling machines accounted for 58 pct. Shipments of most major types of machine tools declined, but boring machines registered a 22 pct increase over 1948.

Sells Sawmill Line—Its line of sawmill machinery has been sold by Allis-Chalmers to James A. Hamilton and Ross E. Langill, who have arranged with the Prescott Co., of Menominee, Mich., to manufacture the equipment. Reason for the sale is to permit the firm to focus attention more fully on its other lines of industrial, power and electrical equipment, says Allis-Chalmers.

Looking for better production



Here, a change to Free-Cutting CARILLOY FC

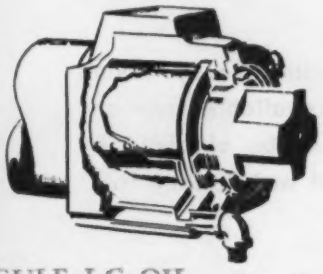
—increased production 14%

—increased tool life 300%

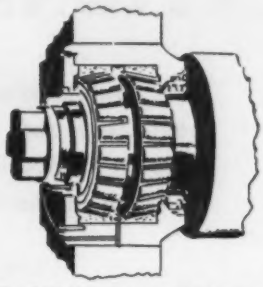
In producing the drum shaft for the winch of their famous "PIPE LAYER," Trackson Company, Milwaukee, formerly used 4¼ " round bars heat treated to 269-321 Brinnel. This vital part requires considerable machining to very close tolerances. Machining difficulties and low tool life ran up the cost and slowed production.

One of our metallurgists suggested the use of Carilloy FC. It worked like a charm, gave better machinability and better mechanical properties as well. Now they turn out more and *better* drum shafts and tools last four times as long.

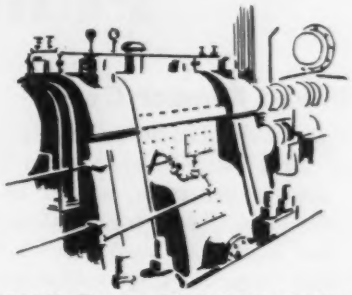
6 aids to improved lubrication, lower maintenance costs for rolling mill equipment



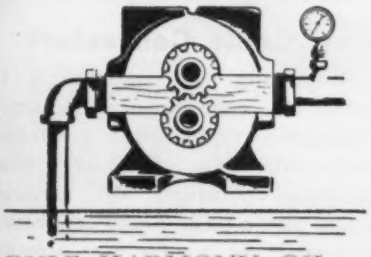
GULF I-C OIL — No. 1 in quality for oil-type back up roll bearings. Proper viscosity range, good water separating characteristics.



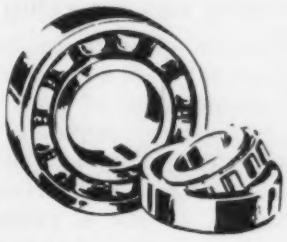
GULF XXX LUBRICANT —The ideal grease for work roll bearings. Extreme pressure type, water resistant, stable!



GULF E. P. LUBRICANTS — better protection for heavily loaded enclosed gears and pinions—good water separating characteristics.



GULF HARMONY OIL — Prevents rust and sludge in hydraulic systems. Good water separating characteristics.



GULF PRECISION GREASE — For better lubrication of ball and roller bearings in steel mill equipment.

GULF LUBRICATION ENGINEERS can help you improve your lubrication practice, reduce your maintenance costs.

It will pay you to investigate their application in your mill... *Call in a Gulf Lubrication Engineer today!*

Gulf Oil Corporation · Gulf Refining Company
GULF BUILDING, PITTSBURGH, PA.
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GULF INDUSTRIAL LUBRICATION

FREE — USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Drill and Reamer Care

If the recommendations made in a new 20-p. booklet are followed by tool room supervisors, master mechanics, tool room foremen—and for that matter all tool rooms and machine shops — they will obtain greater life from cutting tools, thereby cutting their production costs. The booklet, entitled "Care of Drills and Reamers," also covers the field of tungsten carbide tools, in addition to tools made of high speed steels. Tables of cutting speeds are included for handy reference. *Chicago - Latrobe Div., United Drill & Tool Corp.*

For free copy insert No. 1 on postcard.

Reducing Costs

Case histories of metalworking successes and cost reductions of numerous prominent companies are presented in a new 20-p. bulletin to show the vast production possibilities of H-P-M all - hydraulic presses. Each example demonstrates how these presses speed up production, reduce scrap to a minimum and produce a quality product at low cost on a variety of complicated and diversified jobs. The bulletin also describes features of the equipment. *Hydraulic Press Mfg. Co.*

For free copy insert No. 2 on postcard.

Tie It Tight and Right

The 24-p. "Blue Book of Packaging" contains nearly 150 illustrations of modern shipping applications, from parcel post cartons and various methods of bundling to palletizing and carload storage. It is a small atlas of ideas that will give any shipper aid in suggesting newer methods of reinforcing, some of which are novel and economical. Steel strapping and equipment for applying it are described, and a section is devoted to auxiliary equipment. *Gerard Steel Strapping Co.*

For free copy insert No. 3 on postcard.

Cleaning and Finishing

Principles of metal cleaning are explained in a new 24-p. catalog on the Cincinnati line of metal cleaning and finishing equipment. Various types of cleaning and phosphatizing machines are described and illustrated, as are a number of paint spray booths, drying ovens, and other special equipment and accessories. *Cincinnati Cleaning & Finishing Machinery Co.*

For free copy insert No. 4 on postcard.

All-Purpose Refractory

Advantages of KX-99 blast furnace brick, one refractory to meet all requirements from bottom to top, are detailed in a new 12-p. booklet. A blueprint of a typical blast furnace is included to show the manner in which these brick are used throughout the entire lining. Use of the brick in hot metal mixers and hot metal cars is also discussed. *A. P. Green Fire Brick Co.*

For free copy insert No. 5 on postcard.

Automatic Torque Control

Features and uses of Mercury clutches are described in a new series of data folders. A selection of standard styles available for use on electric motor drives and the popular makes of gasoline engines is shown, along with specifications and selection charts. *Mercury Clutch Div., Automatic Steel Products Inc.*

For free copy insert No. 6 on postcard.

Fast Cable Connectors

Requiring just a twist of the wrist to connect or disconnect, Palmgren rapid cable connectors serve every type of industry where welding operations and electrical cable play a part. These connectors, described in a new 4-p. circular, assure positive contact of highest conductivity with joints securely locked. *Chicago Tool & Engineering Co.*

For free copy insert No. 7 on postcard.

Pocket Volt-Ammeter

Designed specifically for the maintenance man, engineer, electrician, and motor repair and service shop, the Amprobe pocket-sized split core volt-ammeter, shown in a 4-p. bulletin, measures current instantly and safely without breaking the circuit. *Pyramid Instrument Co.*

For free copy insert No. 8 on postcard.

Forming and Flanging

Several models of the Beatty motor driven hydraulic forming and flanging presses are shown in a new 8-p. bulletin. These self-

Turn to Page 120

Specify BARBER-COLMAN PIN and WEDGE REAMER DESIGN

FOR BETTER SIZE AND FINISH CONTROL

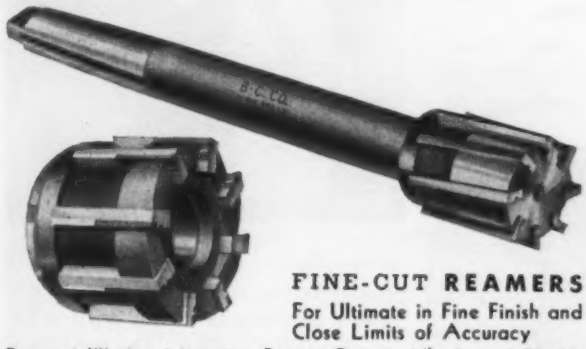
HEAVY-CUT REAMERS

For Greater Stock Removal Roughing, Semi-Finish, Finishing

Pin and Wedge Mounting Equivalent to Solid Flute Construction

Also Right Hand Spiral Blades Available for Heavy Stock Removal

Increased Chip Clearance, Stronger Tooth Backing



FINE-CUT REAMERS

For Ultimate in Fine Finish and Close Limits of Accuracy

Pin and Wedge Mounting Permit Greater Number of Blades for Improved Finish

Blade Adjustment Gives Long Life with Minimum Maintenance Cost

SOLID FLUTED REAMERS

Chucking — Taper — Screw Machine — Jig Boring

Maximum Chip Clearance

Extremely Close Limits of Accuracy

25 YEARS ACCEPTED USE PROVES SUPERIOR JOB PERFORMANCE

- ☆ IRREGULAR BLADE SPACING FOR IMPROVED FINISH
- ☆ MORE BLADES PER REAMER DIAMETER
- ☆ STURDY, NON-SHIFT BLADE MOUNTING
- ☆ EASY ADJUSTMENT, QUICK SET-UP
- ☆ LONGER SERVICE THROUGH IMPROVED SHARPENING
- ☆ NO THREADS OR BEARINGS TO RECONDITION

All Styles in HSS, CAST ALLOY OR CARBIDE TIPPED

Twenty-five years of practical reaming experience cost nothing when you buy Barber-Colman Reamers. Yet this background provides the ultimate in production reaming design, fewer inspection rejects and lowest reaming cost. Check your reaming operations and consult with Barber-Colman Reaming Engineers. Their reaming experience will prove results with maximum job performance. A complete stock selection is available to meet your specific requirements.

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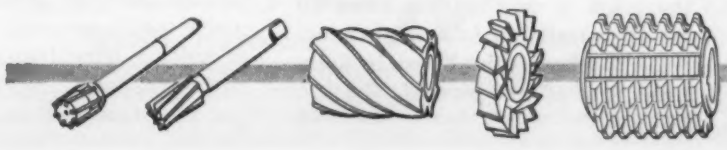


BARBER COLMAN

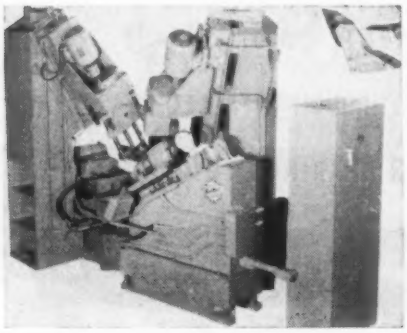
ground to the first platform; each additional section, 6 ft 8 in. Ladder sections are available in three heights. Interchangeable parts make it possible to erect as many sections as the job requires. *Patent Scaffolding Co., Inc.*

For more data insert No. 22 on postcard, p. 35.

Plow Frog Driller

Drills 12 holes 13/32 to 21/32 in. diam at rate of 120 pieces per hp.

Four Roto-Matic power heads, each having independent hydraulic feed and spindle speed change gears are incorporated into a machine for the drilling of holes in plow frogs. An electrically interlocked feed and return stroke permit one head to move into position behind another, after its interlocked unit is in position. Clamping of the workpiece is accomplished by a single hydraulic clamping fixture. Electrically controlled by pushbuttons and electrically sequenced with drilling units permit rapid traverse of the drills only after the workpiece is properly clamped. *Davis & Thompson Co.*

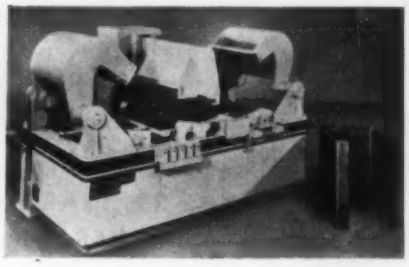


For more data insert No. 23 on postcard, p. 35.

4-Wing Tangent Bender

Forms 125 outer cases for washing machines per hour.

Blanked and punched sheets are fed end-wise into a clear space in the center of the machine. At the press of a button on a control panel at the rear of the machine, a series of fifteen automatic operations begin. The entire machine measures 10½ x 8 1/3 x 6 ft. high. An overhead arm can be bolted in place to provide welding devices so that the entire case can be formed from a flat sheet, welded while in the machine and then unloaded. *Cyril Bath Co.*

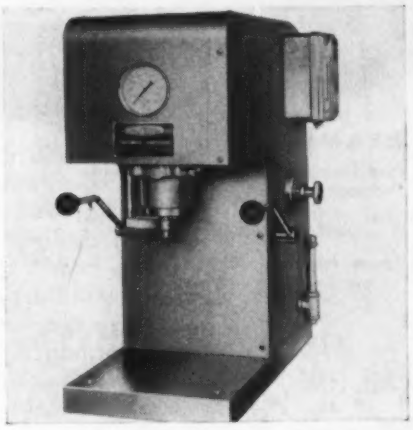


For more data insert No. 24 on postcard, p. 35.

Hydraulic Press

Precision units speed up light production operations.

Available in 1-ton and 2-ton models, a new hydraulic Han-D-Press is self-contained and can be used where compressed air is not available. Mechanical, dual controls are standard, and tamperproof. A 1½ hp, 1800 rpm motor, available in standard voltages, operates a 3.3 gpm constant-volume pump. An adjustable relief valve makes it possible to adjust maximum ram pressure, as shown on the gage, to any setting from 10 pct of capacity to full rated capacity. Stroke of the press is 6 in. and gap is 10 in. *Hannifin Corp.*



For more data insert No. 25 on postcard, p. 35.

Keyhole Saw

Tapered blade turns and locks in eight positions.

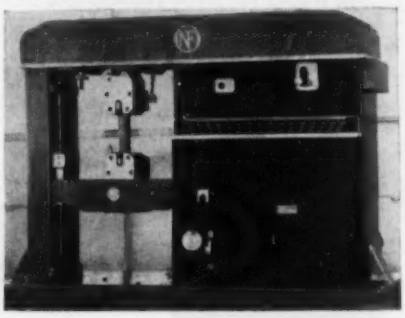
The tapered 11¼ - in. blade reaches into tight places, curves and corners. Equipment includes a 10-tooth-to-the-inch Tuf-Flex blade, with interchangeable blades of a 24-tooth Tuf-Flex and a 7-tooth spring tempered wood-cutting blade. *Millers Falls Co.*

For more data insert No. 26 on postcard, p. 35.

Universal Testing Machine

Table model tests tension, compression, flexure and shear.

A 30,000-lb capacity machine has additional ranges of 6000 and 600 lb; a 15,000-lb model may be used for 3000 or 300-lb testing. Loading is mechanical with crosshead speeds infinitely variable from 0.005 to 6 ipm. The weighing system consists of knife-edge pivot levers connected to calibrated steel elastic beams. It is simple, rugged and permanent. ASTM accuracy is guaranteed. Working space between columns is 20 in. with a 14-in. crosshead stroke. The unit measures 42 in. high x 64 in. wide. *National Forge & Ordnance Co.*



For more data insert No. 27 on postcard, p. 35.

Special Purpose Cutters

Hot metal and metal lath; carbide edged for stainless.

Three new two - hand portable special purpose cutters include a carbide edged cutter with edges firmly brazed to the cutting jaws, for cutting extremely hard materials such as stainless steel rods, wire, pins, etc., up to ⅜ in. diam. For cutting hot steel bars, rods and wire up to ⅝ in. diam, cutters are of special hot work steel, with heat treated jaws to insure long life under continuous duty without loss of cutting edge temper. For cutting expanded metal and heavy

Turn to Page 122

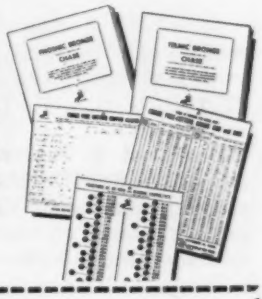
Going around in circles?

. . . it's time you saw *Chase!*

TO better serve you, Chase regularly produces rod in 10 non-leaded alloys, 7 leaded alloys and 2 tellurium-bearing alloys of the highest quality. In this group alone you can probably find *several* answers to your copper alloy rod problems.

However, suggestions for special problems are *readily* available from our Research and Engineering Departments.

Why make it tough when Chase makes it so simple? Start now to get what you want in a high quality copper alloy rod. Call Chase today!



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Complete descriptive information about Chase Free-Cutting Brass, Bronze and Copper is yours for the asking.

Chase Brass & Copper Co., Dept. IA 750
Waterbury 91, Conn.

Please send me: ☐ Free-Cutting Brass, Bronze, Copper Book; ☐ Weight Chart; ☐ Decimal Equivalent Card; ☐ Chart of Free-Cutting Copper Alloys; ☐ Tellurium Copper Book; ☐ Telnic Bronze Book; ☐ Phosnic Bronze Book.

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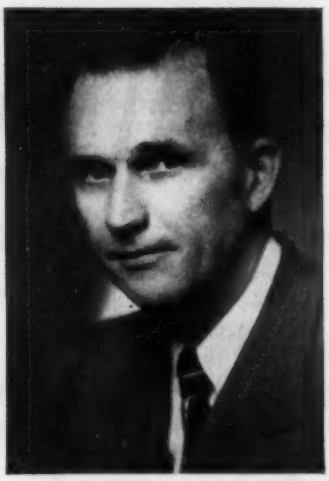
Iron Age *Introduces*

IRVIN L. CLYMER has been named president of Pittsburgh Limestone Corp.

DAVID T. WOODHOUSE was appointed manager of product development and methods, Cleveland Chain & Mfg. Co.



JOHN F. MYERS has been elected president of Westinghouse Electric Supply Co.

Arthur W. Worthington, president, and **Ralph E. Larry**, vice-president, have announced plans to retire from PITTSBURGH LIMESTONE CORP.

Ferdinand M. Brown has returned to WILLYS-OVERLAND MOTORS after an absence of 17 years to become a special assistant to **William S. Venn**, general sales manager.

L. A. Dixon, Jr., was appointed assistant vice-president of the meter and valve division, ROCKWELL MFG. CO., Pittsburgh.

Philip O. Mullane, Jr., was appointed district sales manager of the SOUTHERN CHAIN & MFG. CO., Birmingham.

H. C. Kellogg, director of purchasing engineering for the FORD MOTOR CO., is retiring. **Henry Rourke** will assume Mr. Kellogg's duties.

J. B. Ward becomes vice-president and general manager of ADDRESSOGRAPH-MULTIGRAPH CORP., Cleveland.

Chester Bland was elected to the board of directors of the LELAND CO., Dayton.

Ernest M. Knapp was promoted from treasurer to president of FERRO MACHINE & FOUNDRY INC., Cleveland. **Rex J. Myers** was made vice-president in charge of operations.

Lloyd C. Smith was made vice-president in charge of sales for HELLER BROTHERS CO.

Andrew E. O'Leary has been transferred from St. Louis to Cleveland to direct eastern Ohio sales of DeWalt, Inc., subsidiary of AMERICAN MACHINE & FOUNDRY CO.

Allen H. Jones was appointed manager of the newly-opened Chicago office of PEABODY ENGINEERING CORP., New York.

Harry T. Graham was appointed general sales manager of GENERAL REFRACTORIES CO., Philadelphia. **S. S. Furst**, formerly general sales manager, has been appointed assistant to the vice-president in charge of sales.

Charles J. Ramsburg, Jr., has been appointed manager of sales, welded products, for the Spang-Chalfant Div. of the NATIONAL SUPPLY CO. He succeeds **H. G. Morrow** who has resigned.

Charles R. Peterson has been named personnel manager of the BUDD CO.'S new automobile body components plant in Gary.

Louis E. Theisen has been appointed vice-president in charge of engineering for METAL PRODUCTS CORP., Weehawken, N. J.

Lawson Adams has been named executive vice-president of WROUGHT WASHER MFG. CO. **Walter F. Borges** was made vice-president in charge of sales.

W. S. O'Connor was named distribution manager for NATIONAL SUPER SERVICE CO., INC., Toledo.

George I. Bottcher was appointed chief engineer of ALLEGHENY LUDLUM STEEL CORP. **J. F. Chapman** and **R. E. Smith** were named assistants to the new chief engineer.

Fred A. Kaufman was named general sales manager for the McKAY CO., Pittsburgh. He succeeds **Fred C. Smith** who assumes the position of special assistant to the president.

Roy Boscow has been appointed Pacific divisional sales manager for the PACKARD MOTOR CAR CO.

O. H. Kessler, Jr., assumes the duties of vice-president in charge of finances for STOLPER STEEL PRODUCTS CORP., Milwaukee. **Arthur A. Ladwig** becomes vice-president in charge of manufacturing while **H. C. Chapman** was made treasurer of the corporation.

F. F. Roehll was appointed national sales manager for the EUTECTIC WELDING ALLOYS CORP.

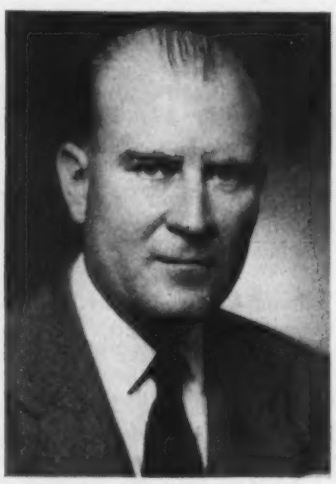
E. W. Blind, superintendent, **John Adolphson,** assistant superintendent and **Joseph Kohlberg,** chief chemist, have joined GREAT LAKES CARBON CORP. and will continue in their present capacities at the St. Louis coke plant which the corporation has just taken over from the LACLEDE GAS LIGHT CO.

John W. Stovall was made manager of the Buffalo district sales office of WORTHINGTON PUMP & MACHINERY CORP., succeeding **William A. Meiter** who steps into the newly established post of central sales manager.

Russel C. Orton and **Royce B. Crimmin** were assigned to the ALLIS-CHALMERS Boston district office as sales representatives.

Appointments to three posts in the research department of STUDEBAKER'S engineering division include: **M. P. deBlumenthal,** assistant chief research engineer; **T. A. Scherger,** chief powerplant engineer and **T. E. Wagar,** chief electrical engineer.

M. Worth Acker was made chief engineer of the MIDVALE CO., Philadelphia. **Edward L. Murphy,** formerly assistant engineer of tests, has been appointed engineer of tests.



E. J. KOLB is the new manager of export sales, Crucible Steel Co. of America.

Iron Age Salutes

HERBERT L. TIGGES

APPOINTMENT of Herbert L. Tigges, executive vice-president of Baker Bros., Inc., to the presidency of the American Society of Tool Engineers, was sincere tribute of his colleagues to a man devoted to industry and country. It was proof of respect for ability and character.

While functioning as an important man in the machine tool industry, Mr. Tigges gives considerable time out of a busy calendar to serving his government. He serves not only in war but in peacetime, recognizing that patriotism is not a duty to be incited in emergency and otherwise neglected.

Starting with Baker Bros., in 1913, Mr. Tigges enlisted as an Army lieutenant in World War I and when World War II struck he was in the thick of the industrial battle to outfit the Armed Services. For 2 years he was advisor and consultant to the Products Manufacturing Div., of the National Securities Board in Washington. In this capacity he directed mobilization and planning activities of the machine tool section so that it would be fit to face the demands of war.

At the recent 2-week economics and industrial conference held at the Brooklyn Naval Yard in New York, Mr. Tigges spoke to a large group of Armed Services reserve officers. As director of the Amtea Corp., which handles machine tool sales in South America for American manufacturers, he boosted American industry abroad.

He is the former director of the National Machine Tool Builders Assn. and has been sales and committee chairman in Toledo. Mr. Tigges is president of the Toledo Sales Executive Club and is a member of the Chamber of Commerce. He has always worked for the betterment of sales courses in colleges.

With 36 years service at Baker Bros., Mr. Tigges worked his way through the engineering department to the post of sales manager and finally to his present job. He is a baseball fan—a little despondent now that the Toledo Mud-Hens are being manhandled in their league.

Sometimes gaging the degree of patriotism and service to country is difficult. Too often zeal for the flag is a facade constructed of cardboard and not manifested by deeds. Mr. Tigges is a performer for both industry and country and he manages to accomplish both jobs at the same time.

FRANK J. MEYER becomes district manager of sales, Pittsburgh office, Lukens Steel Co.

PAUL H. DAVEY, JR., elected vice-president in charge of production, Davey Compressor Co.

JOHN F. LOTT has been appointed general sales manager of Fort Duquesne Steel Co.

Dr. Trygve D. Yensen, manager of the magnetics department of the WESTINGHOUSE RESEARCH LABORATORIES, has announced plans for retirement after a 42-year career in the science of magnetism.

Admiral Lewis L. Strauss, until recently a member of the U. S. ATOMIC ENERGY COMMISSION, and **Charles E. Cotting,** president of LEE HIGGINSON CORP., have been elected to the board of directors of TRACERLAB, INC., Boston.

John F. Frost, Jr., has been named southeastern district sales manager of C. G. HUSSEY & CO.

Leo C. Simmons will become comptroller of NATIONAL TUBE CO. He succeeds **S. B. Kingham,** whose promotion to assistant comptroller of U. S. STEEL CORP. OF DELAWARE was announced in the June 29 issue of THE IRON AGE.

Wade N. Harris assumes the post of vice-president of the MURRAY CORP. OF AMERICA, Detroit.

Royden C. Presley was appointed district sales manager for the Birmingham area, ALLEGHENY LUDLUM STEEL CORP. Mr. Presley had been manager of the Toledo sales office of the company.

L. J. Brady has been named manager of the St. Louis district of the replacement tire sales division of B. F. GOODRICH CO.

Roger B. Merritt was transferred to the Detroit office of the Scintilla Magneto Div. of BENDIX AVIATION CORP., Sidney, N. Y. Mr. Merritt was formerly sales engineer for the company on the eastern seaboard.

Dr. R. Carson Dalzell was appointed to the staff of the U. S. ATOMIC ENERGY COMMISSION'S Reactor Development Div.

Alfred N. Young was appointed sales-service representative of PENNSYLVANIA SALT MFG.'S special chemicals department in the St. Louis area. He succeeds **Charles R. Sorber, Jr.**

Charles T. Button has been appointed director of sales for Holtzer-Cabot Div. of NATIONAL PNEUMATIC CO., INC.

John L. Busey has been elected a vice-president of the GENERAL ELECTRIC CO. and placed in charge of marketing policy, a newly-created post. **William V. O'Brien** was elected a commercial vice-president, while **Charles R. Pritchard** becomes president and a director of the G-E Supply Corp.

John E. Barber has been elected treasurer of COLUMBIA STEEL CO. Mr. Barber succeeds **E. H. Daniel,** who will retire Sept. 1 after serving as treasurer for the past 21 years. Mr. Barber is currently a vice-president of CONSOLIDATED WESTERN STEEL CORP.

Frank Watt has been appointed general sales manager of the metal finishing equipment and supplies division of FREDRIC B. STEVENS, INC., Detroit.

Thomas F. Quinlan has been appointed works comptroller at Harrison, N. J., for WORTHINGTON PUMP & MACHINERY CORP., to succeed the late Wilbur H. Stacy.

Jack C. Schubert was named to the position of Graphitar engineer for the UNITED STATES GRAPHITE CO., Saginaw, Mich.

OBITUARIES

Charles I. Day, president of W. & L. E. Gurley, Troy, N. Y., passed away recently.

Thomas Bellsnyder, founder and president of the Jefferson Foundry Co., Birmingham, died recently. He was 65 years old.

Gustav H. Zimmer, former chief engineer, Buffalo Forge Co., passed away June 29 at the age of 68.

Bradley S. Carr, sales manager of the dredge pump department of American Manganese Steel Div. of American Brake Shoe Co., died recently.

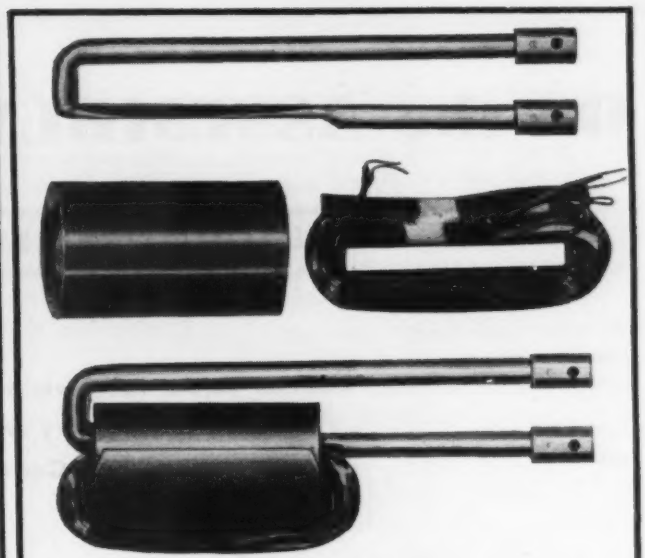
Joseph P. Cattie, president of Joseph P. Cattie & Bros. galvanizing works, Philadelphia, died on July 3.

Wilbur H. Stacy, comptroller at Harrison Works, Worthington Pump & Machinery Corp., died June 23.

William Campbell Whyte, 62, vice-president of the Electro Alloys Div. of the American Brake Shoe Co., died on June 23.

Richard G. McElwee, 60, died recently at Niagara Falls, N. Y., while on a business trip. Mr. McElwee had been recently associated with Vanadium Corp., Detroit.

HEAVY, LESS EFFICIENT and slower to assemble, was the original Weller Soldering Gun composed of the parts shown. Compare these with the fewer parts at right in the new Gun, and you'll readily see why the new streamlined Weller is so popular.



THE NEW WELLER SOLDERING GUN handles 250 watts; heats, ready for use, in five seconds; has longer range to get into the tight spots, and is equipped with spot light. Uses current only when trigger is operated. It is assembled faster. Requires no bolts or nuts. The ⅛" Revere Copper Rod that replaces the secondary coil in the transformer is sheared, flattened, and bent at right angles in a 200-ton press in a single operation.

COPPER TREATS YOUR PRODUCT BETTER WHEN YOU

Control Your Temper

Revere Copper Rod replaces Secondary Coil in Soldering Gun Transformer . . . reduces number of parts, makes for a speedier, more efficient assembly . . . also makes possible a lighter, more compact unit of increased capacity.

WHEN the Weller Manufacturing Company, Easton, Pa., was completing the development of its new electric soldering gun, they were confronted with this problem: The ⅛" Revere Copper Rod used to replace the secondary coil in the transformer had to maintain its rigidity yet be sufficiently soft so that during the shearing, coining, and bending operations there would be no breaking or splitting of the rod.

Revere's Technical Advisory Service recommended a certain temper copper rod. It was discovered that Weller was getting a twist in the rod when it was installed in the assembled gun. Other tempers were tried and tested. Then a copper rod of a slightly harder temper than the first was recommended. That was it! Proper temper was the key. Proper temper was also the key to the .291 dia. copper rod used for the Soldering tip itself. For this, too, had to retain its rigidity and yet remain soft enough to be coined, punched, and formed without fracture.

"In addition to being extremely helpful in arriving at the proper tempers, Revere also recommended that we specify our rod in multiple lengths, and thus save considerably on scrap. They were also helpful in solving the problem of attaching the brass sleeve to the secondary rod in our Soldering Gun," the Weller Manufacturing Company tells us.

So you see, Revere's interest in your problem does not stop with the recommendation of its products. Perhaps Revere can help you. Why not take your current problem to the nearest Revere Sales Office and see?

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

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Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.

Sales Offices in Principal Cities, Distributors Everywhere.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Cadillac deluxe rail train serves Colorado Springs Hotel . . . Machine Tool industry sensitive to crisis . . . Ford introduces "Crestliner" . . . Car-carrier trend continues.

By WALTER G. PATTON

Cadillac Express—If the American railroads are looking seriously for an answer to the problem of light, flexible suburban transportation they may find it profitable to look closely at the "Mountaineer," a special train designed by Cadillac engineers and stylists to transport guests of the Broadmoor Hotel at Colorado Springs from the hotel to the zoo and the famed Will Rogers memorial.

The railroad is only three miles long but the fact that a 160 hp V-8 high compression Cadillac engine pulls 40 passengers up a 17 pct grade gives some idea of the possibilities of high-powered automobile engines for low cost transportation over a railroad right-of-way.

Replacement—Company officials are careful to point out that the new installation is replacing another Cadillac - powered special train. Cadillac stylists and engineers combined their transportation know-how in designing the modern stream-lined job that will be kept busy this summer transporting thousands of guests of the hotel over this famous narrow gage railway. In addition to a Cadillac high compression engine, a Hydra-Matic transmission is used.

Pulse of the Crisis—Most local machine tool sources agree that the place to put a finger on the war situation is to watch machine tool developments. At the start of World War II the machine tool industry was the first to be seriously affected by the war.

This could very well happen again, say industry sources. It hasn't happened yet, however.

Mothball Machinery — During the lull between wars, there has been considerable planning by the auto industry for a national emergency. The outline of this work is hazy but it is believed to be extensive.

Many of the machine tools in moth balls are already outdated but industry plans have been made, it is reported, for standardized tooling, for example, for aircraft engines. However, the delays that will be experienced in getting into mass production can hardly be emphasized too much according to the trade.

Site Still Unknown — A few orders for a new Chrysler V-8 high compression engine were received this week but plans for building the new powerplant are still indefinite. It now appears that the new engine will *not* be built at De Soto but whether Chrysler-Jefferson or Dodge Main is to be the location is still not evident.

Not Till '52—Ford is rolling on its new six cylinder high compression set for Cleveland and there is activity on the new Ford V-8 engine. One fact about the Ford engine program is certain: the new engines will not be available before 1952 models are introduced.

At the moment most of the activity on Mercury and Lincoln engines appears to be linked with the current effort to increase production of existing engines at the Rouge.

Ford "Crestliner"—A distinctly new body design was introduced by Ford last week when the company announced its new Crestliner featuring an airfoil custom paint panel on either side and a basket weave vinyl covering for the steel top.

The new model is available in Sportsman's green with black top and black airfoil side panels or in Coronation red with black top and side panels.

Jet Black Panel — The new panel of jet black covers most of the front fender, three quarters of

the door and extends well into the rear side panel.

Other features of the new model are full wheel chromium plated disks, a decorative molding of polished stainless steel along the bottom edge of the car, two-tone instrument panel and a custom-made chrome molding which separates the two color tones with a die cast chrome nameplate.

Features of Both — Simultaneously, Lincoln-Mercury Div. of Ford has introduced three new custom coupes featuring vinyl-leather covering safety-steel tops. Customized interior and exterior trim are featured.

The cars are designed to have the smart appearance of a convertible plus the comfort and safety of a closed car, according to Lincoln-Mercury sales officials.

Car-Carrier Trend — Another styling trend evident in the automobile industry is the growing popularity of the all-purpose carrier—a car designed for "Sunday calling" and "Monday hauling."

Kaiser-Frazer started this trend several years ago with its Vagabond. The idea of movable seats has caught on and nearly all car producers now have a station wagon in which the seats move out of the way, providing extensive floor space in back of the driver's seat.

Ford's new "Country Squire" double-duty station wagon introduced this week offers a level floor surface comprising 38.8 sq ft after the rear seat is moved and the center seat is folded out of the way. Incidentally the "Country Squire" features mahogany-grained steel side panels framed with natural maple or birch.

From Front to Trunk — The Chrysler Traveler features a rear-seat cushion hinged so it turns up against the front-seat back. The back cushion of the rear seat is hinged at the bottom and swings down on a level with the luggage compartment floor, extending the cargo area from the rear of the front seat to the trunk lid.

The spare tire is carried either in a storage well or in a vertical position next to the left rear door.

Korea and Car Demand—It is still too early to tell the effect of the Korean war on automobile sales. Generally speaking, sales managers are reporting increased pressure for deliveries. In Detroit used car dealers are experiencing a sharp upturn over the Fourth of July holiday, some of which is undoubtedly seasonal.

Thus far the only reports of panicky buying have come from California. Meanwhile, car executives have warned the public there because of the fear of rationing restrictions in buying.

Highest in History—General Motors production for June jumped to 386,934 passenger cars and trucks, the highest monthly total in the company's history. GM schedules were increased 75,000 during June. During the first 6 months this year GM turned out 1,883,902 units compared with 1,363,039 units assembled during the first six months of last year.

Record-breaking Chevy—Chevrolet Div. alone has turned out more than a million cars and trucks during the first 6 months, breaking a production record that had stood for more than 25 years before it toppled under today's high production rate.

Chevrolet output this year exceeds 1949 by more than 50 pct. Last week Chevrolet turned out its 24 millionth car.

Barred — President-elect Laverne Schenk, local 1299, United Steel Workers (CIO) has been barred from taking office by the union's international executive board.

The executive board ruling was based on the charge that Schenk failed to pay a $3.00 initiation fee in 1945 when he started work at Great Lakes Steel Corp. Open charges have been leveled against Schenk that he is pro-Communistic.

THE BULL OF THE WOODS — By J. R. Williams

THERE BEFORE ME, IN ALL THEIR GIGANTIC SPLENDOR, THE MIGHTIEST CRANES EVER BUILT--BROOKLYN NAVY YARD, PITTSBURGH, AUSTRALIA, EVERYWHERE--AND YET YOU, WHO HAD SO MUCH TO DO WITH THEIR CREATION, HAVE NEVER BEEN OUT OF THIS COUNTY TO SEE THEM!
THERE'S SO MUCH TRICK STUFF AROUND IT MAY BE A GAG TO GIT RID OF TH' BULL AROUND HERE FOR A WHILE--BUT HE'LL THINK OF THAT, TOO, AN' WON'T GO!
7-14
J.R.WILLIAMS
A MAN OF THE WORLD

WHAT THE BELL TOLD—

When the Liberty Bell announced our freedom 174 years ago this month, it told all the world a story of mankind's progress. The ancient bell is cracked and silent now, but the freedom it signaled is as vital as ever. It is ours to cherish and protect.

The Wisconsin Steel organization believes that progress and competition are marks of freedom. They make freedom live. Unhampered by tyranny and oppression, we have moved steadily forward, constantly improving our products to compete with other steel producers. We shall continue to do so and our customers will benefit. It is our contribution to our continued freedom, a priceless benefit that we all enjoy.

INTERNATIONAL HARVESTER

WISCONSIN STEEL COMPANY, Affiliate of INTERNATIONAL HARVESTER COMPANY
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WISCONSIN STEEL

WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

Crisis Effect—Western industry is getting a taste of what all-out wartime production might mean. Small as it is, the Korean war has already had a noticeable effect on business.

Western steel producers are forcing furnaces even harder, with indications that production this week will exceed previous records; jobbers report improved business; aircraft plants are stepping up; and railroads are assigning cars for hauling military supplies.

There are indications that the government may re-open two synthetic rubber plants at Torrance and El Segundo, Calif., and there is the possibility that the Long Beach Naval Shipyard, closed recently, may be re-opened for ship repair and for taking part of the standby fleet from mothballs.

How About Steel? — Although western steel capacity has increased even more than the country as a whole since 1940, there are those who still wonder if it is adequate for normal economy let alone one stimulated by a war. Almost all western steel producers are operating well above capacities. Last week Columbia Steel Co. fired up two of its 25-ton open-hearths in the foundry division at Pittsburg, Calif., which were closed down about a year ago.

Both Kaiser Steel Corp. and Geneva Steel Corp. would welcome added ingot capacity and these expansions may not be too far distant.

Manufacturers Are Optimistic—A survey of the California Manufacturers Assn., previous to the outbreak of the Korean war, revealed that these industrialists expected the third quarter to be the best of the year. Sixty-two pct looked for an increase in the volume of business; 26 pct reported that their business will be about the same; and only 10 pct expected a drop. A similar poll conducted earlier this year indicated that only 32 pct of these businessmen expected better business in 1950.

Still More Gas—Following application of the Utah Natural Gas Co. to build a line from San Juan Basin to Salt Lake City, a group of Texas interests filed an application with the Federal Power Commission to construct a $200 million line from the Gulf Coast to the Pacific Northwest via Cheyenne, Wyo.; Salt Lake City and Boise, Ida.

Main line would run to Seattle with laterals to serve Spokane, Wash.; Portland, Ore., and Vancouver, B. C. Sponsors of the project report that Utah and Wyoming producers would be given an opportunity to link up with the line.

Tinplate User Builds—The ninth California plant of American Can Co. is to built soon at Los Angeles at a cost of several million dollars and is expected to be in operation by mid-1951.

Tinplate production in the West continues far below normal demand which is approximately 600,000 tons per year including shipments to Hawaii. Two California steel producers are known to be licking their chops over this inviting market left unsatisfied by local production and are considering ways and means of building facilities to meet the full demand.

Foil for Food—Kaiser Aluminum & Chemical Corp. is now merchandising its household aluminum foil from the plant at Permanente, Calif., directly to brokers who will act as distributors to grocery stores and others who will sell this product for food wrapping in the home.

This product was formerly sold only to converters who processed it and packaged it for the retail trade. A test distribution campaign is now being conducted in San Jose and Fresno, Calif. Reynolds and Alcoa are already distributing foil in a similar manner.

Fire-eaters' Fancy—Seattle firemen have designed something new in fire trucks. Especially built to meet Seattle's traffic and hills it is believed to be the only hook and ladder unit in the country with covered equipment.

It is powered by a 240-hp gasoline engine instead of the conventional 125 hp engine. Weighing 15,000 lbs, the truck is higher and heavier than similar units but is 12 ft shorter, and the regulation 55-ft ladders are made of aluminum in two sections rather than of wood and in three parts.

PART

Over-all length	1"
Stock Diameter	5/16"
Slot	1/4" deep x 5/16"
Head	5/16" dia. x 5/16" long
Small Diameter	1/4" x 23/32" long
Milled Flats	5/32" wide on 23/32" dia.

TOOLING

Davenport 5-spindle Model B

1st position	Form and Support
2nd position	Size (shaving tool) and Support
3rd position	Mill slot (Slotting saw 965 r.p.m. 2¼", 560 s.f.p.m.
4th position	Mill flats and Support
5th position	Radius, chamfer, cut-off (Cut-off tool .0025" feed)

DATA

Material	B-1113
Cycle	3 seconds
Spindle Speed	1930 r.p.m.

875 MORE PIECES per 8-hr. shift

This TEXACO user* also reduces unit costs two other ways

When *Texaco Cleartex Cutting Oil* was placed in service as the coolant on this job, the better cooling and lubrication that resulted showed up quickly in the reduced number of necessary tool grinds.

On the slotting saw, for example, four regrinds in 24 hours were reduced to three. Cut-off tool life was extended from two to six hours. In addition to these worth-while savings in regrinding costs, reduction in down-time enabled the machine to produce an extra 875 pieces per 8-hour shift.

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TEXACO CUTTING, GRINDING AND SOLUBLE OILS FOR FASTER MACHINING

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

NSRB May Not Be Key Agency—Although it appears certain that the National Security Resources Board will have a broad industrial and civilian mobilization plan ready if the need arises, it is doubtful whether this agency would play a key part in the event of a sudden outbreak of full-scale hostilities.

It is a better than even bet that the Munitions Board, and perhaps the Commerce Dept., will bear the initial brunt. NSRB has been leaderless for too long to be as effective as envisioned in the unification act. The new chairman, Stuart Symington, one of the Fair Deal's live wires, has been on the job only 2 months, not long enough for him to completely rejuvenate the agency.

Detail Work at Munitions Board—The Munitions Board, meanwhile, has been working with industry for several years on such details as allocation of plant capacity, scheduling of orders, coordinated procurement, plant security and all the other activities essential to successful prosecution of military action.

The Commerce Dept., under Secretary Sawyer, has done much to achieve better relations with industry and could be an effective liaison factor in the event of serious trouble.

What is Small Business?—Any increase in military orders will undoubtedly boost official Washington's oft-reiterated solicitude for the welfare of so-called small business.

In this connection, there is a definite likelihood of accepting definitions for small business which could erase the political aspects surrounding most of this concern. Any firm employing 500 or less people has received considerable acceptance, but this definition is unreliable if it's applied throughout the business world.

Definitions Study—A study of this problem, by industry, is underway in the Commerce Dept., aided by the Census Bureau. As acceptable definitions by industry or groups of industries are developed, there will be a drive to have them standardized throughout the government.

Preliminary reports have been prepared on two industries. Others are in the works. If the program is successful much of the phoney concern for small business, resulting in large part from the fact that no one agrees on what small business constitutes, might well disappear.

Politics As Usual—Over at the White House that strange mixture of politics and economics brewed by the Chairman of the President's Council of Economic Advisers goes on unabated. Most recent manifestation is the creation by Mr. Keyserling of a Committee on the Southwest Economy, composed of economists from the Southwest.

Earlier, Mr. Keyserling created a Committee of Experts on the New England Economy made up of some of the leading drum beaters for government aid to build a steel mill in New England. It's all good politics, for both groups have been told to study the need for government aid in development of resources within their areas. Should trouble spots begin to crop up for the Fair Deal in the coming fall elections it's a pretty safe bet that there will be more of these committees.

New Use For Patents—Three divisions of the Commerce Dept., the Office of Industry and Commerce, the Office of Technical Services and the Patent Office, have quietly started a program, involving the use of patent files, for the promotion of new products and processes as a means of taking up idle production capacity and providing jobs for idle workers.

While the possibility of increased military production may do away with the need for such a program, it is excellent illustration of what the government can do to help alleviate unemployment without spending huge sums of money.

Technical Aid Offered—The program involves combing the register of patents and setting up separate lists grouped by commodity. These commodity lists, containing ony those patents available for license, are given the widest distribution possible.

OTS is prepared to offer technical advice to any firm believing that a particular patent might be feasible. The office of Industry and Commerce can also help in a limited way in regard to such things as market studies, which are often a burden to small firms interested in new products. In Wilkes-Barre, Pa., one of the nation's distressed unemployment areas, several plants have been invited to look over the available listings.

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How Aircraft Engine Parts Are Barrel Finished

By DUDLEY J. KAHARL, Production Engineer,
Pratt & Whitney Aircraft Div., United Aircraft Corp., East Hartford, Conn.

AT the Pratt & Whitney Aircraft plant in East Hartford, Conn., barrel finishing was used extensively during the war with large savings over hand work, especially in deburring, and improvement in quality and uniformity. Since the war much of the same equipment and some of the same methods have been continued, but the smaller quantities and different types of parts manufactured have made many changes desirable. In addition, advantage has been taken of developments of the process which have been learned since the war.

The number of variables in barrel finishing is so large that it is not easy to choose the optimum combination. Some of the most important of these variables might be listed as: Size, shape and weight of the part to be finished; barrel selection; type, size and quantity of chip to be used; type and amount of compound to be used; amount of water; speed of barrel rotation; length of run; loading and unloading methods; separation of parts from chip mass; and selection of capable operators.

Judgment, based on experience, is necessary and, if first experiments do not yield desired results, changes and further experiments often are found necessary to effect desired quality and economy. To indicate what has been accomplished at Pratt & Whitney, a few typical cases are cited. All effect substantial savings over former methods and in each instance the quality of the finish is either improved or at least equal to that previously obtained. It does not follow, however, that future experimentation will not result in superior finishes or further economies.

Small flanged steel parts are processed in a 4-cu-ft Hartford steel ball barrel with a synthetic rubber lining, turned at 33 rpm, 2500 pieces per charge, 200 lb. of No. 4½ Super-Honite chips, ¼ lb of No. 2-3M (Minnesota Mining) compound and enough water to cover the charge. The parts are run for 3 hr. All burrs are removed and surfaces are honed to desired smoothness.

Aluminum nipples threaded outside, as shown in Fig. 1, are run for 1½ hr at 16 rpm in a Roto-Finish barrel of 32-in. diam. The charge per compartment is 1500 pieces, 500 lb of No. 5 Honite chips, ½ lb of No. 1-3M compound and enough water to stand 4 in. above the charge. All burs are removed and all surfaced honed smooth, yet the threads are unharmed and within tolerances. On this and some other threaded parts, it is not necessary to deburr the thread by hand. The barrel processing deburrs the threads effectively and at low cost. But special attention is required on parts with an outside thread. If heavy burrs appear on surfaces other than those which are threaded, usually a comparatively long tumbling cycle is required. Care must be taken to avoid ruining the threads in an attempt to deburr the other surfaces adequately.

In the case of a flanged cast aluminum bearing, 300 pieces per compartment are tumbled 1 hr at 16 rpm in a 32-in. Roto-Finish barrel. Five hundred lb of No. 4½ Super-Honite chips,

Pratt & Whitney has applied wartime experience and postwar developments to barrel finishing small quantities of a wide variety of parts. Improved quality and lower costs have resulted.

½ lb of No. 1-3M compound and enough water to stand 3 in. above the charge are used in each compartment. All burrs are removed and smoother surfaces result.

FIG. 1—All burrs on this threaded aluminum nipple are removed by barrel finishing, without damage to threads. Piece on right has not been finished.

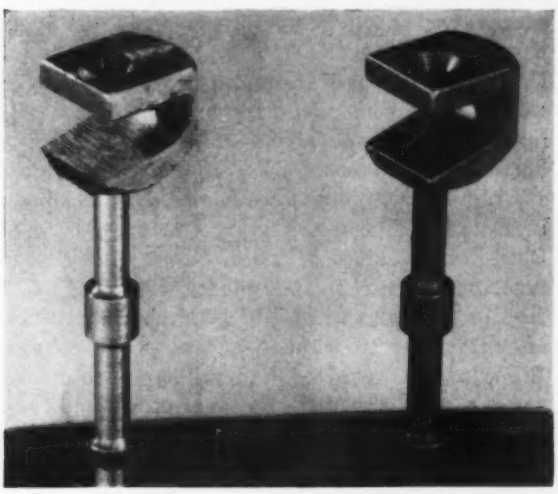

FIG. 2—Steel valve parts as machined (left) and after tumbling (right). All burrs and most tool marks are removed by the barrel finishing.

Valves of the shape shown in Fig. 2 measure about 3 in. high and are machined from steel. Tool marks appear on all machined surfaces, including the hole, and there are many sharp burrs. After a 4-hr tumbling run at 55 rpm in a Almco DBO-1 barrel 16-in. diam, all surfaces are smooth and toolmarks are nearly removed. The charge per compartment is 1000 pieces, 25 lb of No. 3 Super-Honite chips, ½ lb of No. 2-3M compound and water enough to cover the charge. Hand burring on such parts would be expensive and would still leave toolmarks on most machined surfaces.

Stainless steel vanes for jet aircraft engines are highly resistant to abrasion but are made appreciably smoother and edges are rounded within tolerance by a 6-hr tumbling run at 24 rpm in a 32-in. Roto-Finish barrel. In each compartment are 300 pieces, 500 lb of No. 3 Super-Honite chips, ½ lb of No. 2-3M compound and water enough to stand 2 in. above the load. Rounding of edges on an abrasive belt might be done one part at a time, but other surfaces would not be uniformly smoothed, costs would be higher and net results less satisfactory.

Among the parts tumbled without chips are small dome-ended brass plugs. These are run in quantities of 8000 per compartment in an Almco DBO-1 barrel 16 inches in diameter turning at 35 rpm. Water enough to cover the work and ¼ lb of No. 1-3M compound complete the charge. A burr at the bottom end is eliminated, toolmarks nearly disappear and the un-

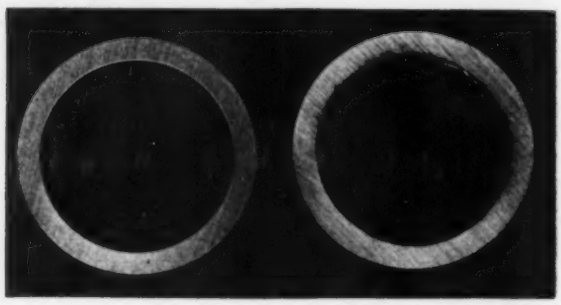

FIG. 3—These rings cut from steel tubing have heavy burrs (right) but they are removed and all edges are rounded by wet tumbling in a barrel.

FIG. 4—This shroud gear is wet tumbled for 1 hr in chips and compound. Manual burring on this part used to take 5½ hr.

machined diameter is honed smooth. When the load is dumped, hosed off and dried, it is ready for use since there are no chips to separate from the parts.

Another part treated in similar fashion, but using chips, is the ring cut from steel tubing, Fig. 3, about ⅜ in. OD. About 4000 of these rings, 25 lb of No. 4½ Super-Honite chips, ¼

lb of No. 2-3M compound and water level with the charge are loaded per compartment of a DBO-1 barrel which is rotated at 55 rpm for 2½ hr. Burrs disappear, edges are slightly rounded and faces are considerably smoothed, although negligible toolmarks still show.

Although parts such as these rings and the brass plugs could be hand burred, it would be slow, costly and tiring work and the degree of uniformity would be greatly inferior to that attained with very little labor in the tumbling process. The rings are easily and quickly separated from the chips by screening.

Wet barrel finishing is applicable to large precision parts, as Fig. 4 indicates; this piece being a stainless steel shroud gear for an aircraft engine. Precision parts of this size generally have to be handled one per compartment to avoid the possibility of nicks from impact of part on part. For the shroud gear, the deburring is done in 1 hr in a 32-in. wood-lined Roto-Finish barrel turning at 12 rpm.

In the compartment are 700 lb of No. 4½ Super-Honite chips, 1½ lb of No. 1-3M compound and water about 6 in. over the charge. The manual labor is chiefly that needed to put the gear in the compartment, remove it, rinse it off, and put another in place. This takes about 12 min. The chips can remain in the compartment indefinitely, but the compartment is flushed out, new compound and fresh water being added for each run.

The only chip handling for this gear is that needed to put the chips in place initially. They can be flushed by pushing the water hose deep into the mass and allowing the water to run a few minutes and overflow from the mouth of the barrel. Naturally, the cost is far less than that for the 5½ hr of skilled labor formerly consumed in manual deburring, and the degree of uniformity in barrel work is much improved. In addition, machined surfaces are smoothed and all sharp edges are deburred well within tolerances.

Although extra large volumes of small parts such as pins, washers or clips can be processed in larger barrels, it has been found much more economical to use small barrels turning at high speeds for small to medium lots of such parts, such as are commonly found in aircraft engine plants today. The small barrel requires only a light load of chips which simplifies handling problems. For large parts large barrels are needed partly because a heavy chip load is desired to promote the abrasive action that is necessary. It must be remembered, though, that beyond a certain point an increase in the chip load will reduce abrasion because of a retarded mass flow.

In the Pratt & Whitney Aircraft plant, larger barrels remaining from war work, when quantities were much greater, are still used extensively, but many such will be replaced by small barrels as new equipment is purchased.

New Books

"Gear Cutting Practice," by F. H. Colvin and F. A. Stanley. The third edition of this practical machinists' guide to gear cutting methods and standards presents data on all aspects of gear cutting practice. It shows how to handle all kinds of gear jobs by methods used in leading shops, describes various types of gears, setting up and operation of machines for producing them, cutting and finishing methods and other useful information. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18. $4.75. 532 p.

* * *

"ASTM Standards on Industrial Water." This new compilation presents standard methods of sampling, analysis and testing of industrial water. The methods described have been developed particularly for the examination of water employed industrially in the generation of steam or for process or cooling purposes, and for the examination of deposits formed from such waters. All standard practices currently in use are included and fully described. American Society for Testing Materials, 1916 Race St., Philadelphia 3. $1.75. 142 p.

* * *

"ASTM Standard on Petroleum Products and Lubricants." This latest compilation (Nov. 1949) brings together most of the ASTM standards, test methods and specifications widely used in this field. Covered are motor and aviation fuels, diesel and burner fuels, kerosene and illuminating oils, lubricating oils, greases, petrolatums and paraffin waxes, plant spray oils and petroleum sulfonates, cutting fluids, electrical insulating oils, light hydrocarbons, hydrocarbon solvents, crude petroleum, thermometers and miscellaneous. American Society for Testing Materials, 1916 Race St., Philadelphia 3. $5.50. 750 p.

Air Pollution—

POLLUTION

By HENRY F. HEBLEY
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Industry faces new restrictions in the form of gas, dust and fume ordinances. Laws have come up fast and enforcement has been so sudden and inconsistent, that industry has sometimes been unfairly treated. The need for simple techniques for evaluating atmospheric pollution is increasing. Because the contaminants vary and because different industrial processes are involved, it is impossible to use only one method to measure atmos-

MAN through the centuries has relied on the discharge of gases from the chimney to rid himself of the trade wastes associated with his industrial and domestic activities. For the most part, nature is indulgent enough to dissipate these wastes throughout the atmosphere and all is well. However, there are times when the system temporarily fails either partially or completely, causing very disturbing results. These notes consider the influences that control the natural dissipation of air-borne trade wastes.

If a study is made of the areas that experience atmospheric pollution, rather striking similarities may be observed. The accompanying table presents a few of them. For the most part, they are in valleys or basins dominated by heavy industry. Several are situated in the rather steep valleys of the Allegheny Mountains, part of the Appalachian system. This system is notorious for the formation of radiation fogs and air drainage into the valleys and lowlands. The surrounding hills furnish effective protection from strong winds.

As pointed out by Byers[1], this area experiences the greatest number of days per annum of dense radiation fogs. Such fogs have their maximum occurrence when there is a lot of water vapor present and cooling by nocturnal radiation takes place. With the high specific humidities of summer in this area, still prevailing in August and September, and with the nights growing longer there is a concentration of these foggy days from August to October, inclusive. Thus the valleys that embrace most of the iron, steel and chemical industries of the United States are also those in which the air drainage and inversions of the temperature gradient are prevalent.

The height of chimneys on openhearth furnaces is seldom over 150 ft, and the discharge heights on blast furnace vents are of a similar order. The discharges of bessemer converters are even lower.

The power plants of industry seldom have chimneys over 250 ft high. In addition, the heavy railroad transportation necessary to serve these great enterprises is necessarily located at or near the water level of the rivers. Thus both natural and man-made conditions conspire to create a situation conducive to heavy atmospheric pollution when meteorological factors favor it.

A micrometeorological investigation of the industrial area of metropolitan Pittsburgh is imperative. Such research would show how to improve conditions. To date, the author knows of no studies that have been used in the siting and design of chimneys in this area.

Unfortunately, the topography surrounding Pittsburgh is so complicated and rugged that some suggested guides will not work. Hewson and Longley[2] have made an ingenious study of the atmospheric pollution from the gases discharged from the smelter at Trail, B. C. In

(*Continued on page* 88)

A Major Problem for Industry

pheric pollution. The industrialist must first determine the extent of air polution from his processes before he can hope to arrive at a method for controlling it. Stack sampling is not new, but is now being recognized. These two articles present several aspects of the problem. They are abstracts of papers given before the First National Air Pollution Symposium, Pasadena, Calif., Nov. 10-11, 1949.

STACK SAMPLING

By **LESLIE SILVERMAN**
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STACK sampling can be approached from two distinct directions. Atmospheric pollution in communities is due to discharge from industrial operations and stacks, home heating, motor vehicles, and from many other sources. The end result in all cases is the same: Contamination of the atmosphere around the source of pollution. Industrial-stack sampling is more specific than sampling of the neighborhood atmosphere. For this reason it was recognized early that a good index of pollution control could be obtained by measuring the stack or effluent concentration. This has a distinct advantage for the analyst because concentrations in the stack are many times greater than in the ambient atmosphere.

Many air pollution authorities have set up indices of stack pollution. Establishment of such codes or regulations has increased rapidly in the past few years. The Los Angeles code is perhaps the most completely delineated ordinance, law or regulation in this direction. In addition to prohibiting emission of dense smoke, regulations now cover fly ash, fumes, noxious gases and other contaminants.

Smoke pollution in the past has been measured by an index of visibility using the now outmoded Ringelmann chart.[1] Solid particulate material settling in the atmosphere has been measured by simple means such as settling pans located in the area in question. Today limiting stack concentrations of many materials have been specified but no methods have been prescribed for taking the samples on which the limits must be based.

Because of the installation of control devices for removing gaseous and particulate material before stack discharge, sampling and analytical methods must be capable of handling high and low concentrations and a wide range of particle sizes from submicroscopic to macroscopic. It is therefore essential to determine the performance of the gas cleaning equipment, if any, and to determine concentrations existing in the stack. These stack limits also influence one important factor in sample collection: The amount of material to be collected in order to make a reliable analysis.

Polution of the atmosphere in areas near stacks or in neighborhoods is an important sampling problem. As yet no limits have been established for such concentrations unless they approach those existing within the plant. For the latter situations, the so-called maximum allowable concentration is used.[2]

The collection principles applied to stack sampling are numerous. Methods have been devised by several different industries such as power, steel and oil. In each case the purpose was to determine the loss from the operation or the amount of material being discharged into the atmosphere. Stack contaminants to be collected vary from gaseous to particulate in size. Sampling methods will therefore depend on the nature of the contaminant. In many cases the contaminants are mixed, containing a variety of

(*Continued on page* 87)

COMPARISON OF DEVICES USED FOR STACK, EFFLUENT, AND AEROSOL SAMPLING

Principle of Method	Instrument and References*	Application	Sample Volume	Sampling Rate	Percent Efficiency	Particle Size Range (Microns)	Method of Quantitation	Remarks
Sedimentation	Settling pan[9]	General atmospheres and stacks (low concentrations)	440 ml.	Unknown	?	High–low 10-mesh–variable	Weight, count, or chemical analysis	Not usually used in stack sampling because size of aliquot is not representative. Difficulty in Green cell is one of microscopic measurement, also requires long settling time for small sizes.
	Sedimentation cell[10]		50 ml. small	Instantaneous	100	10-mesh–0.2		
Visual or photometric	Ringelmann chart[11]	Stacks and high concentrations			Direct Reading		Comparison with standards	This chart is subject to many limitations cited in the reference.
	Tyndallometer[12]			Variable	Direct Reading	10–0.1	Visual recording	This device has largely been replaced by direct-reading photometric units.
	Photoelectric densitometer[13]			Variable	Direct Reading	10–0.1	Photometric density	Devices of this type have been improved and several designs been developed. The latest include electronic methods of counting particle but only in dilute suspensions.
Inertial and centrifugal	Labyrinth[14]	Stacks and process effluents	Large	Variable	?	10-mesh–1	Weight, count, or chemical analysis	Labyrinth device separates material in proportion to terminal velocity. Efficiency of all inertial or centrifugal separating devices vary with sampling rate and particle size. Efficiencies stated are on a weight basis. On a count efficiency values obtained are all less than 50 pct.
	Midget cyclone[15]		Large	25–50 cfm	98	10-mesh–5		
	Aerotec tube Design 2[16]		Large	35 cfm	94	10-mesh–5		
Impingement (impaction and jet condensation)	Owens[17]	General atmospheres and after gas-cleaning devices	50–100 ml. small	Instantaneous	99	10–0.2	Count	Adapted to low concentrations only. Particle sizing may be done directly on slide.
	Konimeter[18]		2.5–5 ml. small	Instantaneous	99	10–0.2	Count	Adapted to low concentrations only.
	Bausch & Lomb[19]		0.01 cu. ft.	Instantaneous	99	10–0.2	Count	Modified Owens with simplified dark-field counting microscope integral with instrument.
	Impinger[20]		Medium	1 cfm	93–96	25–0.5	Count, weight, or chemical analysis	Can be used for both gases and particulate material. If operated at sonic nozzle velocity, efficiency for particles as small as 0.1μ is reportedly 100 pct. Can only be used for readily soluble gases.
	Cascade impactor[21]		Small	17 lpm	95	100–0.2	Count or chemical analysis	Provides a rapid means of fractionating aerosol by terminal velocity. Not well adapted to high concentrations if slides are to be counted. For absolute efficiency use sonic velocity in last stage.
Filtration	Paper thimble[22]	Stack and general atmospheres		1–3 cfm	95	10-mesh–0.2	Weight or chemical analysis	Not adapted to high temperatures or moist atmospheres.
	Paper disks or pleated paper[23]		Small, medium, or large	1–3 cfm 40–60 cfm	99	10-mesh–0.2		Can measure quantitatively by discoloration in low concentrations "Tar Camera," A.S.H. & V.E., U. S. Bureau of Standards use modifications.
	Cotton, wool, or asbestos bags[24]		Large	10–50 cfm	99	10-mesh–1		Life is limited and handling of sample for particle sizing is difficult. Primarily adapted to weight determination.
	Glass fibers, cloth, or alumdum thimbles[25]		Small, medium, or large	1–3 cfm	90–95	10-mesh–1		Alundum filters possess high flow resistance. Glass cloth and fibers may have low efficiency if not fine fibers or well packed. Glass filters (Shotts) appear to give good results.
	Wire screen or gauge[26]		Large	1–10 cfm	50–70	10-mesh–10		Material for screen is 400-mesh cloth, which is expensive. Efficiency is variable. Not satisfactory for fine materials until bed is accumulated.
	Volatile or soluble crystals[27]		Small, medium, or large	1–30 cfm	35–90	10-mesh–0.2		Not adapted to high temperatures. Industrial Hygiene Foundation has modified method for high volume sampling.
Washing or scrubbing	Simple bubbling[28] devices	Stack and general atmospheres	Small	0.5–1 cfm	90–95	10-mesh–10	Chemical weight	Efficiency low for particulate material unless it is very coarse. Efficiency for gases is dependent on their solubility and rate of reaction.
	Sintered glass absorbers[28]		Small	0.1–0.5 cfm	95	10–0.2	Chemical weight	Highest efficiency devices for gases. For particulate material rate must be kept low. Porosity of sintered glass affects efficiency since separation is due to filtration and scrubbing.
	Wetted packed towers (bead columns, etc.)[28]		Medium	1–3 cfm	90–95	10-mesh–10	Chemical weight	Efficiency depends on solubility and reactivity of gas and absorbent. Particulate material is retained in proportion to porosity of packing and velocity.
	Venturi scrubber[29]		Large	30–40 cfm	90–95	10-mesh–0.2	Chemical weight	This is a portable device using the principle of the Pease-Anthony unit. The collecting medium is recirculated. Adapted to both gaseous and particulate material but the gases should be readily soluble in water.

Continued from Page 85

substances in either gaseous or particulate form or a combination of the two. Methods which have been used for this purpose are detailed in the accompanying table. Perhaps the most widely used method is some form of the filtration principle. There are certain situations where the gases are hot or excessively moist making it necessary to use special filtration media. The use of paper thimbles presents an example of heat and moisture ilimitations and glass or ceramic materials are substituted. This has not always been successful because natural fibers, such as wool, cotton or cellulose, have better filtering characteristics than the fire-resistant materials.

The sampling of gases does not present as serious a problem as particulate material since gases are easily trapped and determined quantitatively. In the case of particulate material there are several variables. The most important ones are particle size, mass, agglomeration or charge (since this affects the agglomeration rate), and certain other particle characteristics such as shape and surface conditions. Several factors have recently been grouped by utilizing the concept of the terminal velocity or particles. Terminal velocity as pointed out by Foley[3] is a much better index of the characteristics to be considered in the inertial separation of particles from a gas stream. This concept may also have application in stack sampling.

The collection of the sample from the stack should not be regarded as simply inserting a probe into the stack and obtaining a sample at a reasonable rate. This may result in considerable error because it is necessary to remove the sample from the stack at a rate which corresponds to the stack velocity. The error magnitude is reported differently by several observers,[4, 5, 6] however, agreement exists on the fact that the sample should be collected isokinetically. The sampling head must also be parallel to the direction of gas flow to avoid error.

Several methods of determining sampling rate have been developed by different investigators. Automatic devices have been widely used since they eliminate the problem of sampling flow determination by the investigator. (But the simplest approach of course is to determine the stack at the same velocity.) Devices have been developed by the ASME[7] for doing this automatically. Companies manufacturing dust separating equipment have also devised different units for this purpose. These devices have been modified by many workers in the field but their essential feature is to withdraw the same isokinetically. In our opinion such automatic devices while useful do not eliminate the need for determining the

Precipitation	Thermal precipitator[30]	General atmospheres and after cleaning devices	Small	5-10 ml./min.	99	5μ-0.2	Count	Not adapted to high concentrations or large particles. Excellent for particle sizing including electron micrograph work.
	Electrostatic precipitator[31]	Stack and general atmospheres	Small, medium, or large	1-3 cfm	99	80μ-0.2	Count, weight, or chemical	May be used in A.D. or D.C. form. D.C. is more practical for field use and requires less voltage. For hot gases arcing becomes a problem. Large particles may not be trapped but precleaner can be used in series.
Miscellaneous:								
Adsorption	Tubes or cartridges filled with activated charcoal, silica gel, or alumina[32]	Stack and general atmospheres	Small, medium, or large	1-10 liters/min.	99	Gases	Chemical weight	Applicable only to gases which can be absorbed readily at normal temperatures. Volume of sample collected must be held within adsorptive capacity. Adsorbent may be stripped for chemical or physical analysis.
Absorption (on solids)	Same as above filled with dry solid chemical[17]		Small	1-10 liters/min.	99	Gases	Weight	Typical use is to determine acid gases on soda lime or alkali. Moisture interference must be eliminated.
Condensation	Freezing trap[17]		Small	0.1-1 liter/min.	99	Gases	Chemical	Applicable to a wide variety of materials depending upon temperature of freezing bath (i.e., dry ice or liquid nitrogen).

References

[1] "Inadequacy of the Ringelman Chart," by L. S. Marks, Mech. Eng., 59: 683, 1937.

[2] "Industrial Air Sampling and Analysis," by Leslie Silverman, Chemistry & Toxicology Bull. No. 1. Pittsburgh: Industrial Hygiene Foundation, 1947.

[3] "Terminal Velocity as the Measure of Dust Particle Characteristics," by R. B. Foley, Trans. ASME, 69: 101, 1947.

[4] "Characteristics of Large Hell-Gate Direct-Fired Boiler Units," by W. E. Caldwell, Trans. ASME, 56: 73, 1934.

[5] "Messung von Flugstaub in Rauchgasen," by E. Zimmerman, Zeit. d. v. Deutt. Ing., 75: 481, 1931.

[6] "Die Dynamik des Staubes und ihr Einfluss auf die Staubbehallmessungen," by W. Fahrenbach, Forsch, a. f. dem. Geb. d. Ing. 2: 395, 1931.

[7] "Test Code for Dust Separating Apparatus," ASME, Power Test Codes, New York, 1941.

[8] "Mist and Dust Collection in Industry and Buildings," by C. E. Lapple, Heating, Piping and Air Conditioning, July, August, October, November, 1944: December 1945: February 1946.

Continued on page 88

velocity profile and the quantity of stack gases being discharged.

[9] Shaw and Owens. "The Smoke Problem of Great Cities," Constable & Co., Ltd., London, 1925.
[10] Green, J. Indust. Hyg., 16: 29, 1934.
[11] Marks, Mech. Eng., 59: 681, 1937.
[12] Drinker and Hatch, "Industrial Dust," McGraw-Hill, New York, 1936.
[13] Hill, J. S. I., XIV: 296, 1937.
[14] Briscoe et al., Trans. Inst. Min. and Met., June 1937.
[15] Stern, Combustion, 4: 35, 1933.
[16] The Thermix Corp., Greenwich, Conn., 1949.
[17] Jacobs, "The Analytical Chemistry of Industrial Poisons, Hazards and Solvents," Interscience, New York, 1941.
[18] Brown, Schrenk, and Littlefield, U. S. Bureau of Mines Information Circular 6993, February 1938.
[19] Gurney, Williams, and Meigs, J. Indust. Hyg. & Toxicol., 20: 24, 1938.
[20] Bloomfield and Dalla Valle, Pub. Health Bull. No. 217, Washington, D. C., 1935.
[21] May, J. S. I. 22: 187, 1945; Sonkin, J. Indust. Hyg. & Toxicol., 28: 269, 1946.
[22] Brady and Touzalin, Indust. & Eng. Chem., 3: 662, 1911.
[23] Katz and Smith, U. S. Bureau of Mines, Report of Investigations 2378, 1922.
[24] Bubar, H. H., "Bagtest Sampler," Old Lyme, Conn.
[25] Western Precipitation Corp. Bull. W P 50, 1948.
[26] Hardie, P. H., Trans. ASME, 59: 355, 1937.
[27] Matthews, Analyst, 63: 467, 1938.
[28] Silverman, "Industrial Air Sampling and Analysis," Chem. & Tox. Bull. No. 1.
[29] Silverman (cited above).
[30] Silverman (cited above).
[31] Magill, Stanford Research Inst., 1949; Collins, Seaborne, and Anthony, Paper Trade J., January 15, 1948.
[32] Watson, Trans. Faraday Soc., 32: 1073, 1936.
[33] Drinker and Hatch (cited above); Western Precipitation Corp. (cited above).
[34] Cook and Coleman, J. Indust. Hyg. & Toxicol., 18: 194, 1936.

this study **stability, turbulence** and **gustiness,** as an indication of turbulence were employed, and such a method of approach could be applied to situations similar to Pittsburgh.

The quiescent autumn months of September, October and November, during which inversion conditions are frequently encountered, bring about rather striking effects due to air drainage from the tributary valleys into the main river system. Such air currents carry with them impurities released from centers of industry upstream. Under such stable conditions, turbulence practically dies out and the chimney discharge travels downstream in a ribbon often below hilltop height.

Causes of Fall Fogs

An accompanying phase of stable air conditions caused by inversions is the presence of numerous **condensation nuclei.** As pointed out by Aitken[3], and later verified by others, the presence in the atmosphere of sulfur dioxide discharged with the products of combustion from industrial activities encourages the formation of heavy fog.

The oxidation of SO_2 to SO_3 under the influence of the sun's ultra-violet rays creates highly hyroscopic nuclei suitable for extremely heavy fog formation. This phenomenon of a noticeable increase in the fog density in the Pittsburgh area soon after sunrise can be observed repeatedly.

The growing need for the proper disposal of industrial waste gases, and the research of the meteorologist in the phenomena of turbulence, diffusion and dispersion, eddy currents and **gustiness,** have prompted the application of this knowledge to a few cases of chimney design.

How to Design Adequate Stacks

Bosanquet[4] in association with Pearson and Nonhebel derived one of the first formulas based on theoretical and experimental studies carried out by Imperial Chemical Co. Since then the analysis has been further considered. Rough indications can now be obtained so that a chimney may be suitably located and designed with sufficient elevation and stack-gas outlet velocity to yield reasonable assurance that chance fumigations will not have serious effects. To approach the problem intelligently and with due regard to design limitations and economics, the meteorologist must be apprised by the health authorities of the permissible concentrations of deleterious gases. The tolerances for continuous or limited exposure, of humans, animals and plant life are desirable; but this field to date has been inadequately investigated in its relation to the free atmosphere.

AREAS OF ATMOSPHERIC POLLUTION

Name of Area	Dominating Industry	Terrain	Located On	Proximity of Body of Water	Proximity of Hills	Description of Area
Chicago	Steel, packing, general	Plains	Lake Shore	Lake Michigan	None	Practically level
St. Louis, (E. St. Louis, Illinois)	Steel, chemicals, general	Plains	River	Mississippi	Mississippi River Basin	Between river banks
Salt Lake City	Smelters, bituminous coal	Hilly	Lake Shore	Great Salt Lake	Wasatch Mountains	Basin
Knoxville Tennessee	Zinc, copper, iron, general	Hilly	River	Tennessee	Appalachian Range	Basin
Pittsburgh	Steel, bituminous coal, glass	Hilly	Rivers	Allegheny and Monongahela	Appalachian Range	Series of valleys
Cincinnati	Processing, chemicals, general	Hilly	River	Ohio	Ohio River Basin	Valley
Morgantown	Bituminous coal, glass	Hilly	River	Monongahela	Appalachian Range	Valley
Charlestown	Bituminous coal, chemicals	Hilly	River	Kanawha	Appalachian Range	Valley
Youngstown	Steel	Hilly	River	Mahoning	Appalachian Range	Valley
Birmingham	Steel, bituminous coal	Hilly	Valley		Appalachian Range	Basin
Johnstown, Pennsylvania	Steel	Hilly	River	Stoney Creek	Appalachian Range	Valley

The type of discharge exerts a great influence on the problem. Such effluents may vary from particular matter that has a comparatively rapid settling rate to gases that may experience a cycle of decay and alteration. In addition, odors may well be a dominating factor.

Beers[5] calls attention to this. He notes that people could not tolerate even small concentrations of ammonia or hydrogen sulfide for 10 min though an equal concentration of sulfur dioxide may pass unnoticed.

Four Sources of Pollution

Sutton[6] has divided the sources into four classes: (1) A continuous point discharge, similar to a single chimney, (2) an instantaneous point discharge similar to the fumes released from a blast furnace during a slip, (3) a continuous line source discharge similar to a battery of openhearth chimneys, and (4) a continuous area discharge similar to the congested area of dwellings or a burning refuse pile at a coal mine. Each presents its own particular problem.

Brunt[7], applying the theory presented by Sutton, indicates the contour lines of surface concentration and shows that the maximum concentration of sulfur dioxide at the ground level occurs at a distance from the chimney equal to approximately 10 chimney heights. This applies to average conditions of turbulence caused by thermal convection.

If, as experienced on a sunny afternoon in summer, the turbulence is more pronounced, then the banner of chimney gases will be disrupted more violently and the maximum concentration will be encountered at about 8 chimney heights from the base.

On clear nights when stable air conditions prevail, the point of maximum concentration may be much farther away.

An interesting application of Brunt's analysis was made in siting the chimney for the Valley Power Station, Bradford, England. The plant is located in a valley. Although the electricity commissioners recommended a height of 250 ft, it was decided to increase the height to 350 ft because of the topography.

Excellent work has been carried on in applying meteorology to the siting and design of chimneys by Hill, Thomas and Abersold[8] of the American Smelting & Refining Co. Studies were made by the agricultural department of the company and measurements made of the concentrations of sulfur dioxide in the air at ground level at different distances from the smelter chimneys. These observations were correlated with the various weather conditions experienced. Large fumigation experiments were conducted on crops of various kinds to determine their tolerance to fumigation. Controls were adopted to evaluate the influence to humidity, soil moisture and sunlight.

Height of Stack Important

On the basis of these experiments, it was found that a 200-ft smelter chimney could yield injurious concentrations. A 350-ft chimney was then erected. Although conditions improved, fumigations strong enough to damage sensitive plants were experienced. As a consequence, a 455-ft chimney was erected and dispersion was greatly improved. Only during the most sustained stable conditions lasting for hours did objectionable concentration reach the ground. To make the gases more buoyant they were reheated at the base of the stack. Based on this work many of the copper smelters installed high stacks.

Much more research needs to be carried out on the micrometeorological effects on the discharge of waste products to the atmosphere. It will require the combined efforts of a number of professions to present a satisfactory method of attack on the air pollution problem.

References

[1] General Meteorology, H. R. Byers, New York, McGraw Hill, 1944, p. 525.

[2] Meteorology, Theoretical and Applied, E. W. Hewson and R. W. Longley, New York, Wiley & Sons, 1944, p. 438.

[3] "On Dust, Fog and Clouds," by John Aitken, Proceedings, Royal Soc. of Edinburgh, Vol. 37, 1894, and "Collected Scientific Papers," ibid, Vol. 20, 1893.

[4] "Diffusion of Chimney Gases," by R. Bosanquet, Journal of the Institute of Fuel, February 1935.

[5] "Stack Meteorology and Atmospheric Disposal of Radioactive Waste," by N. R. Beers, Nucleonics.

[6] "Convection in the Atmosphere Near the Ground," by O. G. Sutton, Journal of Royal Meteorological Soc., Vol. 74, No. 319, 1948.

[7] "Dispersal of Gases and Dust from Tall Chimneys," by D. Brunt, Proceedings of the Symposium on Pulverized Fuel, Pulverized Fuel Conference, 1947.

[8] "Hot Gases from Stacks—A Practical Means of Overcoming Objectional Concentrations of Effluent Gases," by G. R. Hill, M. D. Thomas and J. N. Abersold, Smoke Preventional Assn. of America, 1949, p. 26.

New Machine Increases Gear Production

By WALTER G. PATTON, Detroit Editor, THE IRON AGE

WITH its recently designed No. 8 Bevel Revacycle machine, GM's Pontiac Motor Car Div. is cutting—during two 8-hr shifts—24 side gears or 36 differential pinions for every foot of floor space occupied by the machines. Loading and unloading is completely automatic. These latest Gleason machines reject gear blanks for incorrect ID of the hole or if the blank is loaded backward. After rejection, the machine resumes its cycle without requiring the attention of an attendant.

Some idea of the extraordinary cutting speed of the new machines may be appreciated from the fact that a side gear tooth is cut in just 2.65 sec. The Pontiac side gear has 16 teeth and approximately 120 g of metal have to be removed. Production rate of the new Gleason Revacycle machine for side gears is 60 per hr. The Pontiac pinion has 11 teeth and 78.5 g of metal are removed. Production rate for pinions is 90 per hr.

In this department, Pontiac has 6 Gleason Revacycle machines producing a total of 540 pinions per hr and 8 Revacycle machines whose total hourly output is 480 side gears per hr.

The Revacycle process is a unique method of generating straight bevel gear teeth in one cut from solid metal. A large diameter, disk-type cutter is employed. The cutter blades extend radially outward from the cutter head. Each blade has two concave cutting edges. Cutter blades are 18-4-1 type high speed steel.

The cutter rotates in a horizontal plane. During the cutting operation the blank is held motionless while the cutter is moved by means of a cam in a straight line across the face of the gear or pinion and parallel to its root line. This motion produces the straight tooth bottom. The desired tooth shape is produced by the combined effect of the motion of the cutter and the design of the cutter blades.

Each Cutter Has Three Blades

Each rotating cutter contains three kinds of blades—roughing, semi-finishing and finishing. A tooth space is completed after each revolution.

Fig. 3 is a diagram of a Revacycle cutter as it begins to cut. The first blade just nicks the crown of the blank. The blades gradually increase in length until the root line of the tooth

FIG. 1—Part of Pontiac's line of Revacycle machines, which have boosted production of differential side gears and pinions.

is reached. Usually about 50 roughing blades are used.

Fig. 4 shows a transverse view of the tooth space as roughed to full depth. Roughing chips extend almost the full width of the slot. During the first part of the roughing, the cutter cen-

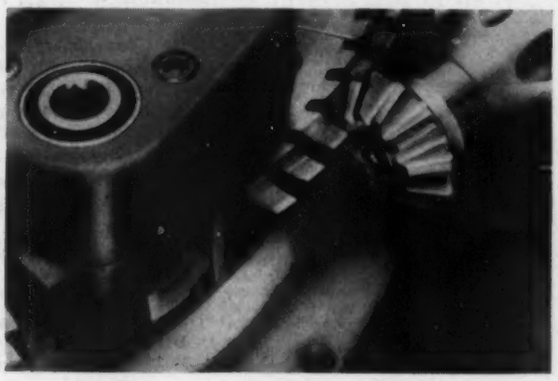


FIG. 2—Closeup of a Revacycle cutter finishing the last tooth of a pinion gear. The burring tool is in the left foreground.

Pontiac Motors, one of the earliest users of the new-type Gleason Revacycle machine, now releases production figures. Its 14 machines cut 540 pinions and 480 side gears per hr—as high as 18 gears per shift per sq ft of floor space occupied.

ter moves from A to B in Fig. 3. It remains at B until full depth is reached. The BC stroke is for 10 semifinishing blades and the CD return stroke is for finishing.

While the finishing cutter returns from C to D, each blade is given a different shape so those which cut at the large end of the stroke are wider and those that cut at the small end are narrower. This produces correct tooth taper as well as proper profile shape.

Crowning of the teeth is accomplished by having the blades cutting at either end of the tooth space slightly wider than necessary for correct taper.

After the last blade has passed through the slot, there is a gap in the circular cutter that permits indexing for the next tooth. The cutter does not stop until the gear or pinion is completed.

Having cut all the teeth, an automatic stop operates to halt the cutter. Withdrawal of the work-head from the cutting position and dechucking of the gear is accomplished by reversing the single control lever. However, an automatic loading device has been developed for handling high-production automobile differential gears. Chucking and dechucking are automatic and the operator's only responsibility is to keep the loader filled. A special attachment permits burring during the cutting operation.

Available feeds range from 5.5 to 1.96 sec per tooth. A built-in chip conveyer deposits chips outside the machine. Power chucking is provided. Expanding arbors are used on both the gear and pinion.

Pontiac gears are made of SAE 1018 steel, normalized to 195 Bhn. Forging stock is specified for the gears. Pinions are made from SAE 1018 bar stock normalized to the same hardness. Lubrication is accomplished by 5 pct lard oil and S9 blending oil.

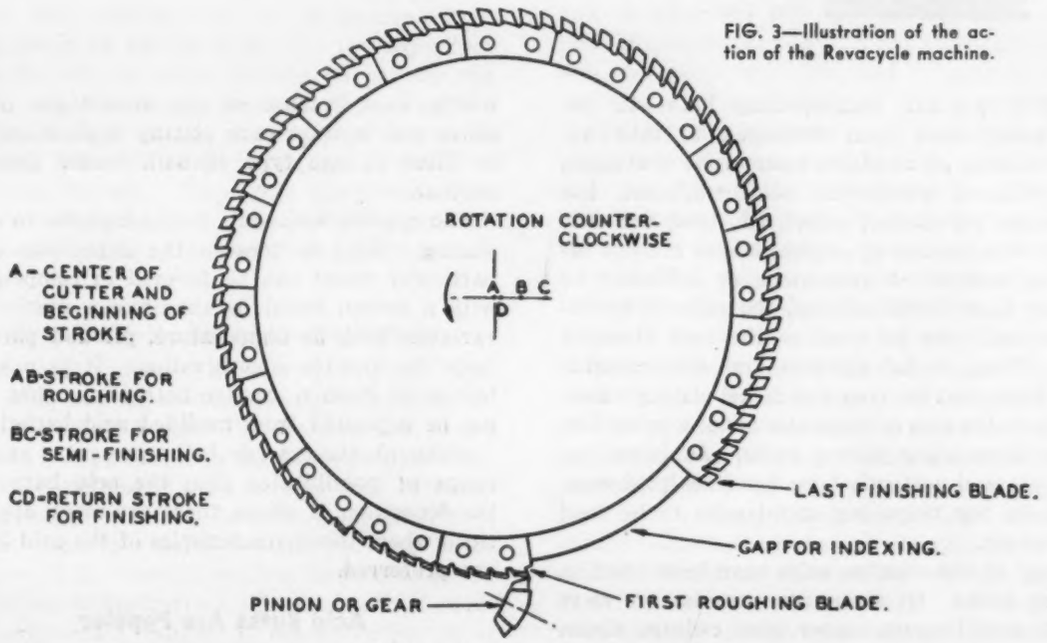


FIG. 3—Illustration of the action of the Revacycle machine.

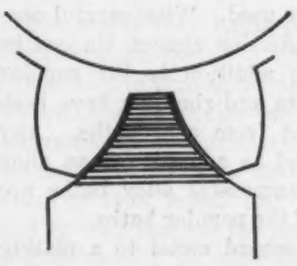


FIG. 4—Transverse view of tooth space as roughed to full depth.

Specifications for the parts follow the usual rigid automotive standards. After the Revacycle operation, runout at the pitch line is held within 0.001 in. Tooth size is held within 0.002 in. Quality is controlled by checking a piece from each machine at least once every 2 hr for size and contact.

Heat treatment after rough machining is as follows: Carburize at 1650°F, water quench; draw 375°F; finish; carburize to case depth of 0.030 to 0.040 in.

Maintenance of close quality control has enabled Pontiac to ship its differentials to the various assembly plants without a running test of the side gears and pinions.

ACID BATHS

OFFER ELECTROPLATING ADVANTAGES

Though there are only a few practical acid electroplating baths, their use with small amounts of noble metal addition agents creates many new alloy compositions and permits new control methods. Acid plating solutions operate at higher anode and cathode efficiencies than do alkaline baths. They are not subject to typical alkaline decomposition.

By J. B. MOLLER
Director of Research
Johnson Bronze Co.
New Castle, Pa.

THE popular electroplating baths in use today have been developed to take advantage of available commercial chemicals. The cheapest commercial acid, sulphuric, has been used for copper, nickel, tin, iron, and zinc salts. Where salts of sulphuric acid are not desirable, because of limitations of solubility or plating bath characteristics, the salts of hydrochloric acid can be used as the next cheapest acid. Thus, nickel chloride and iron chloride have been used for iron and nickel plating baths. However, the cost of chemicals is not a great factor in formulating plating baths. Acids such as fluoboric and sulfamic have been accepted commercially for preparing metal salts to be used for plating.

Many of the alkaline salts have been tried in plating baths. Of these, the cyanides are more widely used because copper, zinc, cadium, silver, gold, indium and a number of alloys can be deposited with relative ease. The cyanide baths are popular because (1) they are characterized by high throwing power, and (2) they are noncorrosive to steel tanks. The popular cyanide baths are relatively simple to control. They can be operated indefinitely with only occasional purification.

Alkaline baths have the following disadvantages: (1) Chemical decomposition takes place to form carbonates. This necessitates periodic purification of the solution. (2) Anode and cathode efficiencies are often less than 100 pct. (3) The plating rate is often limited by low cathode efficiencies at high current densities. Despite these disadvantages, the baths are widely used because of the advantages noted above and because each plating application can be fitted to one type of bath better than to another.

The cyanide baths are quite adaptable to alloy plating. This is because the deposition of a particular metal can be favored in competition with a second metal by changing a number of variables such as temperature, pH and particularly the cyanide concentration. It is possible to deposit from a cyanide bath alloys that cannot be deposited from modified acid baths!

Although the cyanide baths present a greater range of possibilities than the acid baths for the deposition of alloys, there are many applications where the characteristics of the acid baths are preferred.

Acid Baths Are Popular

Acid plating baths are popular because they operate at high anode and cathode efficiencies and are not subject to the decomposition typical of the various alkaline baths. The chromic acid bath is one of the few exceptions.

Copper, zinc, nickel, iron and lead can be deposited from relatively simple acid baths. Addition agents are usually used. With careful control of a number of addition agents, tin can be added to the list. In addition to the popular baths, cadmium, indium and rhodium have been commercially deposited from acid baths. Any of these might be used as a basis for an alloy bath since the most successful alloy baths are modifications of one of the popular baths.

The addition of a second metal to a plating

solution makes it possible to introduce changes in the properties of the first metal to a greater extent than can be brought about by changing the conditions of electrolysis. Alloys are not as easy to formulate by electroplating as they are by thermal methods. The desired alloy is greatly limited by the electrochemical characteristics of its metal salt solutions. These same limitations make it possible to deposit pure metals in the presence of many metal impurities. They also make it possible to remove metal impurities that do interfere. In this manner, the electrochemical characteristics of metal addition agents have become a boon to the electroplating industry in the attainment of pure metal deposits.

The deposition of alloys in acid baths is limited. In spite of this, there are a great many possibilities because of the endless variation of properties possible by the addition of even small amounts of metal to another metal. Nickel-cobalt is widely deposited because bright deposits can be obtained with less of the characteristic acid bath troubles. Addition agents are used in bright nickel baths. Lead-tin alloys are popular for engineering applications.

The ideal plating bath for deposition of an alloy would be one in which (1) the deposition potential of two metals would be exactly the same, and (2) the changes in deposition potential of each of the metals concerned would respond alike to temperature, salt concentration and current. This ideal condition would assure a reproductible alloy depending only on the concentration of the metal salts in the plating bath.

Cyanide Baths Favor Co-Deposition

The ideal conditions are never obtained. However, they are approached closely enough in the practical alloy baths. In the cyanide baths, cyanide is used to change the deposition potential of one metal more than another and to bring about conditions that favor co-deposition. This can be done in cyanide or other alkaline baths because of the ease of making large changes in metal ion concentrations. Because of this control over great ranges of concentration, it is possible to co-deposit such metals as copper and zinc in all proportions. These same alloys cannot be co-deposited in all proportions from practical acid baths. The reason is that copper has a much greater tendency to deposit than zinc when both metals exist as simple irons, as they do in the acid bath.

Successful alloy baths from acid solutions are restricted to metals that are similar electrochemically in acid solutions. There is little hope of making favorable changes by suppressing ionization or by concentration control. For conventional baths, this limits possibilities pretty much to iron, cobalt and nickel for one system and to lead and tin for another.

However, if an alloy system is desired with only small amounts of a second metal present, then a number of alloys are possible from acid baths because of the tendency of one metal to displace another whether current is flowing or not. Thus, if a small amount of copper is present in a zinc bath it will co-deposit easily with the zinc during electrolysis.

With solutions containing simple metal ions, two guiding principles govern the operation of the baths: (1) Metals that co-deposit must be of an equal value on the electrochemical scale (equal deposition potentials); and (2) small amounts of noble metals are easily deposited along with a second base metal. The principles of operation of acid alloy baths are shown by the behavior of the lead alloy baths.

Resorcinol Reverses Nobility

Lead-tin alloys show how successful operation depends on the tendency of the ions of each of the metals to deposit at the cathode. The deposition potentials of lead and tin are close together in acid solutions such as fluoboric, sulfamic or perchloric acid. Yet, if current is applied to such an acid solution containing lead and tin salts, the lead will deposit exclusive of tin. If gelatine is added to the solution then tin will co-deposit with the lead. Apparently the presence of the colloidal gelatine increases the tendency of tin to deposit. This makes lead-tin alloy deposition practical. With gelatine the bath can be operated satisfactorily. However, lead still has a tendency to deposit more easily than tin. As the noble metal in the lead-tin system, lead will decrease in the deposit with increase in current density. Further, it will increase in the deposit with increase in agitation.

This tendency for the composition of the deposit to vary with changes in conditions is not desirable since it means that composition control will be difficult for plating on irregular shapes. However, this condition can be corrected to a large extent by the use of a secondary addition agent such as resorcinol. By adding resorcinol, the nobility of lead and tin in an acid bath can be reversed. At the proper concentration of addition agent, the tendency for composition change with change in plating conditions can be held to a minimum. Fig. 1 shows the effect of resorcinol on the amount of tin in the deposit with change in current density.

With a small amount of resorcinol in the bath, the tin increases with increase in current density. With a larger amount, the tin decreases with increases in current density. The lead-tin plating system in acid baths is typical of most alloy baths. Such a bath will respond to changes in concentration of the salts of either of the metals present. If the concentration of tin is increased, more tin will be obtained in the deposit. The same is true of the lead. An advantage of such a system is that alloy anodes can be used without trouble arising from anode

solubility. The system also does away with sludge formation caused by anode immersion plating. This alloy system can be called a po-

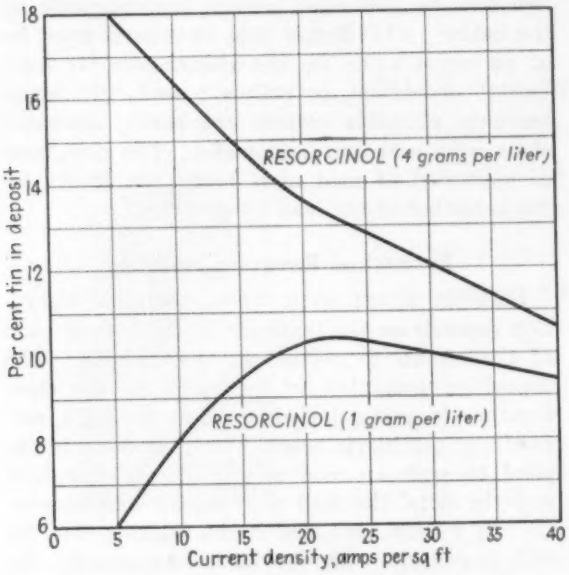


FIG. 1—Resorcinol, a secondary addition agent, can change the nobility of lead or tin in an acid bath as shown above.

tential system since the behavior of the bath is consistent with operation that would be expected for two metals with the same deposition potential.

When a metal salt of a noble metal such as copper, antimony, or arsenic is added to a lead fluoborate bath, such a metal will deposit in the presence of lead whether the current is flowing or not. Also, it will deposit on the anode at approximately the same rate as it does on the cathode. The plating rate of noble metals is only limited by the diffusion rate of the metal ions.

Difficult to Maintain Balance

An alloy of lead and copper deposited from a fluoborate bath would appear to present several difficulties that would limit its use. The major difficulty would be with the anode. Copper would continuously deposit on the lead anode to cause difficulty with solution of the lead. Also, it would be hard to maintain bath balance if copper were being removed both at the anode and the cathode. Further trouble might be encountered with adhesion. This may occur where one of the metals is being deposited by an action more similar to immersion plating than to electrolytic deposition.

Actually, all these anticipated troubles will take place in a system of this kind if fairly large amounts of copper are present in the bath. If small amounts of copper are present in the bath, the same troubles exist but the degree is such that they do not make the bath inoperable. Copper will appear on the anodes as an anode sludge, but it is not too severe. The anodes can be bagged or they can be wiped periodically to take care of this difficulty.

The addition of a noble metal to an acid bath has certain advantages. The metal will have some addition agent effect. The constant plating of the noble metal will refine the grain size of a metal such as lead so that the noble metal may be regarded as a secondary addition agent. But, the metal must be one that is compatible metallurgically with the base metal. That is, it must be one that will enter into solid solution or form compounds with the base. If the metal will not enter into the lattice of the base metal, plating will be rough, banded, or pitted. It will also cause trouble similar to that resulting from metal impurities in common plating baths.

A more important advantage of the use of a small amount of noble metal in an acid bath is that an alloy may be formed. If an alloy is formed, the deposit will have the properties of an alloy rather than those of a pure metal. Therefore, by the use of a second metal, deposits may be produced with more desirable physical properties or with more resistance to corrosion than the base metal.

Behavior of Ternary Baths

Copper is often added to a lead-tin plating bath to produce a temporary alloy for the precision plating of bearing surfaces. The behavior of such a ternary bath is approximately what one would expect from a knowledge of (1) the lead-tin fluoborate bath, and (2) the effect of a noble metal on the electrolysis characteristics of a lead fluoborate bath. The copper has little effect on the lead and tin deposition characteristics other than acting as a secondary addition agent. The control of the quality of deposit is a little easier when using the addition agent in the presence of copper. But, the ratio of lead and tin in the bath depends mostly on the presence of gelatine and the ratio of soluble lead to stanuous tin in the bath.

The amount of copper in the deposit is affected by the gelatine in the bath. The rate of copper deposition is slower in the presence of gelatine. Apparently the gelatine makes the cathode film thicker or more viscous and thus decreases the rate at which copper ions reach the cathode. The copper plating rate is not affected by the concentration of lead and tin in the bath. If the amount of these metals is increased, the amount of copper appearing in the deposit will remain the same.

The lead and tin in the deposit can be plated in all proportions but the copper is limited. If the copper is increased much beyond its ability to form an alloy, a rough useless deposit will result.

From the characteristics of acid baths, the possibilities for new alloy combinations may be

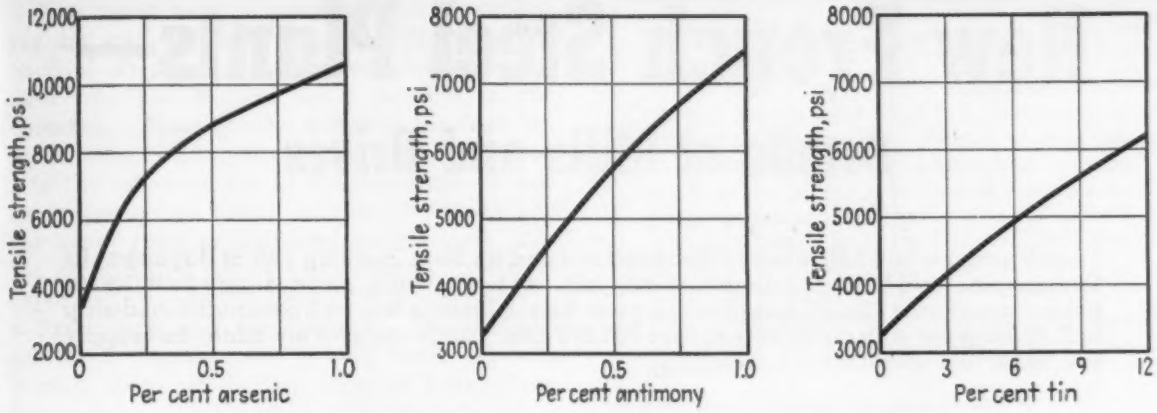


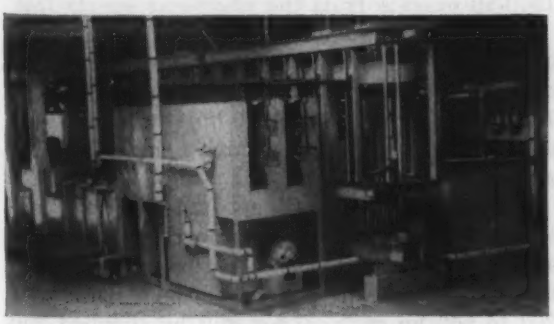
FIG. 2—Addition of small percentages of a second metal to a lead fluoborate bath results in changes in the tensile strengths of the electrodeposited alloy.

predicted. Where the equilibrium potentials of two metals are close together, the deposition potentials may be favorable or at least may be brought together by the use of an addition agent. If a noble metal is added to a bath, it may produce a useful alloy or have an addition agent effect where the metals are compatible metallurgically. Not only does this method of approach make possible the electrodeposition of many alloys but it makes it possible to rely on the metals as a source for addition agents. However, the effect cannot be predicted with certainty.

Offhand, one might expect that iron would be of benefit as an addition to a nickel bath. Yet iron is a notorious trouble-maker in nickel baths. Cobalt in a nickel bath helps produce bright deposits with the aid of certain addition agents. Perhaps cobalt and nickel may help an iron bath and the termary alloy may have great possibilities. It is questionable what copper would do to such a system. There is no reason why as many as four metals could not be used in an alloy bath. If three are introduced from an alloy anode, and the fourth is periodically added as a noble metal, control would not be difficult.

Thus, the possibilities for alloy deposits are unlimited. The questions to be answered are: (1) What alloys are liable to produce the properties desired in electrodeposits? (2) What alloys can be electrodeposited?

Alloys are more resistant to corrosion and wear than base metals. The addition of a few per cent of a second metal may result in remarkable changes in the properties. Fig. 2 shows the tensile strength obtained in the deposit by the addition of arsenic, antimony, or tin to a lead fluoborate bath. Also, alloys are possible through electrodeposition that cannot be easily made by thermal methods. By electrolytic means a solution of antimony in lead is obtained that can only be obtained thermally by casting followed by extreme cold working. Copper is soluble in lead to a greater extent in electrodeposits from acid baths than in cast alloys. This increased solubility is apparently due to the very small crystal size of electrodeposits.



TYPICAL ACID INSTALLATION: Small parts are bright cobalt-nickel plated in this typical installation. Sequence includes precleaning, plating, rinsing, and final drying. Courtesy, Hanson-Van Winkle-Munning Co.

Experiments Plentiful, Testing Insufficient

There has been a great deal of experimentation with alloy baths. Unfortunately these experiments have not been followed with sufficient testing of the deposits. Small amounts of copper have been added to lead and tin baths. Other metals that are noble to lead and tin can easily be co-deposited. The iron-cobalt-nickel alloys are certainly a fertile field.

In general, the tendency has been to exclude metals from a plating bath to maintain control. It is little more trouble to control the concentration of a second metal than to keep it out. Small amounts of tin or copper in an acid zinc bath would undoubtedly cause an anode sludge. This can be tolerated merely by bagging the anode.

In some acid baths it is very difficult to keep troublesome metals out. Perhaps it would be easier to merely control the concentration and limit them to alloy formation. The possibilities of the use of small amounts of noble metals in acid baths as a control method have been hardly touched.

REFERENCES

1. The Iron Age, Nov. 25, 1948, p. 84-88.
2. Fink and Lah. Trans. Electrochem Soc. 58 373 (1930).
3. Blum and Harring, Trans. Electrochem Soc. 40 287 (1921).
4. The Iron Age, April 10, 1947, p. 60-63.

New French Steel Plants—

Details of Mills and Drives

French group is building a heavy blooming mill and an 80-in. hot-strip mill at Hayange. Its Ebange plant will have a tandem cold-strip mill, two temper mills, and auxiliary facilities for production of over 250,000 tons of strip a year. Also at Ebange will be a continuous cold-strip mill for tin-plate with a capacity of over 300,000 tons. Plants are near ore mines and supply sources of fuel and other raw materials.

By **GLENN E. STOLZ**, Consulting Metalworking Engineer
Westinghouse Electric Corp., East Pittsburgh, Pa.

THE steel mills to be built by Sollac at Hayange and Ebange in the Moselle area of France will be completely mechanized plants for the production of light steel plate, sheet steel, and tinplate. The plant to be built at Hayange will have a blooming mill with a capacity of 1,000,000 tons per year and a hot-strip mill with a capacity of 700,000 tons per year. The plant at Ebange will have two pickling lines, a tandem cold-strip mill for sheet steel, two temper mills and facilities for shearing and annealing. The capacity of this plant will be between 250,000 and 300,000 tons.

The Ebange plant will also have a continuous cold-strip mill for tinplate having a capacity of 300,000 to 400,000 tons. In addition, there will be two electrolytic cleaning lines, a skin-pass mill, and facilities for shearing and annealing the finished steel. These two integrated plants will be connected by their own private standard gage railroad.

An unusual fact about these plants is that they will produce the finished steel at a distance of only 6 km from the mines where the iron ore is obtained. The entire steel producing activity of the Sollac organization enables the metal-producing factories and their finishing and tinning plants to obtain their source materials within the nearby area. Also, the fuel for the furnaces is available within the immediate vicinity. This gives the flexibility derived from short transportation distances and ready availability.

Equipment is Ultra Modern

The facilities being supplied for these plants are the latest and most up-to-date equipment available today. The all-electric drives and controls include the main roll motors for each unit as well as the auxiliaries and necessary equipment for obtaining the desired form of power.

The blooming mill at Hayange is a high-lift reversing mill for rolling slabs 14 to 62 in. wide. The mill will be driven by a 7000-hp 40 to 80-rpm motor. Power for this motor is supplied by a motor-generator-flywheel set. The slabs produced here will be supplied to an 80-in. hot-strip mill in the same plant.

The slabbing mill screw-down is driven by mill-type motors supplied with power from variable-voltage motor-generator sets. The main tables and the manipulating equipment for the main tables are similarly driven.

The input power supply for this mill is 3-phase, 50-cycle current at 13,800 v. This voltage is suitable for the main roll motors. The auxiliary motors rated between 300 and 1700 hp will be supplied with 3150 v. The ac motors below 300 hp will use 380 v. A 1500-kw rectifier will supply 250 v dc to the auxiliaries on direct current application.

Slabs Are Cross Rolled

An 80-in., 11-stand hot-strip mill will roll strip from the slabs furnished by the 45-in. slabbing mill. This strip mill is powered by five ac motors and six dc motors. A 1000-hp wound-rotor induction motor drives the initial, or scale breaking, roll in the train. A 3500-hp wound-rotor induction motor having a flywheel drives the first roughing stand. This number one roughing stand is a broad-side stand that widens the steel slab on the first pass. The other three roughing stands are each driven by 4500-hp synchronous motors. All these motors except the 1000-hp operate from the plant's ac supply line.

The finishing stands of the train are supplied by the necessary variable speed dc motors, which have their power supplied by three 6000-kw, 700-v rectifiers. Two 4500-hp, three 5000-hp, and one 4000-hp dc motors drive these finishing stands.

These dc motors will not use starting contactors or resistance equipment, but will be started by the use of phase control. Included in the roughing train are four edger motors of 200 to 500 hp each. They will be supplied 250 v dc from auxiliary rectifiers. These motors as well as other auxiliary dc motors, such as on the cranes, will be supplied by three 1500-kw rectifiers located in the hot-mill motor room.

This motor room is provided with a ventilating and cooling system that can deliver 300,000 cu ft of air per min. A recirculating system is used with the blowers being installed in the basement. These blowers will draw air from the motor room through the electrical equipment and into the water-coolers in the basement. From the water coolers, the air is then forced back into the motor room at the lower temperature. Air for replenishing the closed circulating system is supplied from the outside and is drawn through a Precipitron unit for cleaning. The make-up air for the motor room is kept under pressure slightly above atmospheric to avoid leakage into the room.

Cold Mill Rated at 5000 fpm

At Ebange, the five stands of the tandem cold mill will be driven by successively larger variable speed dc motors. The stands, in order, will be driven by motors rated at 1500, 2500, 3000, 3500, and 4500 hp. An 800-hp motor will drive the take up reel. Power for these motors is supplied by two large motor-generator sets. One MG set is driven by an 8700-hp motor and the other by a 9000-hp synchronous motor. Both operate on the supply current of 13,800 v. These synchronous motors, as well as those on the roughing stands at the Hayange hot-strip mill, will be equipped with regulators for varying the field current in proportion to the load to assist in maintaining the power factor of the plants near 100 pct. This cold-strip mill will deliver the finished strip at a speed as high as 5000 fpm.

The two-stand skin-pass mill at Ebange will deliver the finished steel at a rate up to 3815 fpm. It will be provided with an uncoiler, tension rolls, and a winding reel. On the first stand of this mill, twin motors are connected to the back-up rolls, bottom and top. Power for the motors of this skin-pass mill is supplied by a 2950-hp synchronous motor driving individual generators for each of the motors.

The pickle line is equipped with dc variable voltage motors for driving the line equipment and ac motors for the constant speed auxiliaries. This line will have an entry-end speed up to 1000 fpm and will deliver at a speed up to 420 fpm. The dc auxiliaries will be supplied by three 1000-kw, 250-v dc rectifiers. The ac auxiliaries will be supplied by transformers from the plant power line.

These facilities will be as modern and as efficient as any plant in the world. They will increase France's production in the basic industries and will also make for the production of larger amounts of consumer goods.

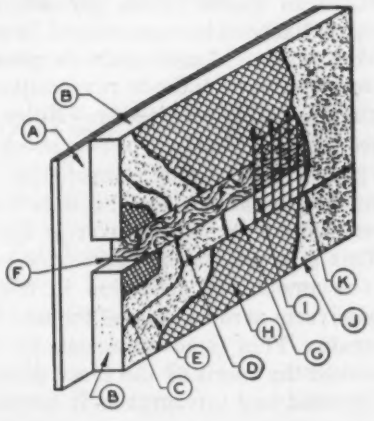
The Sollac Group

* The nine French steel companies composing Sollac are: Ets. J. J. Carnaud et Forges de Basse-Indre; Forges et Acieries de Dilling; Forges de Gueugnon; Ste des Acieries de Longwy; Forges et Acieries de Longwy; Forges et Acieries de la Marine & D'Home Court; Les Petits-Fils de F. de Wendel & Cie.; Ste Lorraine des Acieries de Rombas; U.C.P.M.I.; Societe de Wendel & Cie. Their combined production represents one half of the capacity of the French steel industry.

Expansion Joints Prevent Insulation Cracks

LARGE headed metal vessels such as boilers, tanks, towers, finishing ovens and furnaces don't always remain the same size. During initial firing or shutdown, appreciable expansion or contraction occur as temperatures change.

Unless precautionary measures are taken, the insulation on such large surfaces will crack and buckle. Proper insulation design is necessary to allow for joints in the insulating layer that will expand and contract with the metal surface.



On equipment operating above 600°F, horizontal expansion joints should be provided at 12 to 16-ft intervals. As shown in the diagram, these joints consist essentially of 1½ to 2-in. wide furrows of loose mineral wool, F, covered with protecting flaps of galvanized hardware cloth, between adjacent blanket edges.

The recommended sequence of material application can be followed from A to I in the diagram. The width of the mastic and rosin paper strips, D and G, adjacent to the cleavage side of the furrow should be 4 in.

The bottom edge of the hardware cloth flap, I, is left free to move up or down as the metal surface expands or contracts. Finally, after asphalt weatherproofing mastic, J, is troweled over the whole job, a line of cleavage, K, is struck at the lower edge of each expansion flap with the point of a trowel.

Portable Unit Photographs Stress and Strain Curves

A NEW type, portable strain amplifier, designed for use with any standard cathode ray oscilloscope measures mechanical reactions detected by bonded wire strain gages.

This instrument, manufactured by the Baldwin Locomotive Works, Philadelphia, may be used for load measurements, stress analysis, and function analysis during operation of equipment. Results show amplitude, frequency, and wave form of sharp transients; steady state oscillations; and static loads or their combinations, Fig. 1. The displacement, acceleration, vibration, damping, timing, weight and pressure can be seen and measured during operation of machines or mechanical devices. Data may be recorded by means of either special high speed cameras or an ordinary still camera without shutter.

Measuring Dynamic Strain

A typical application is the measurement of dynamic circumferential strain in a gun barrel when the gun is being fired, Fig. 2. The strain amplifier is used in conjunction with: (1) A resistance wire strain gage bonded around the barrel and over the gun chamber; (2) a cathode ray oscilloscope; and (3) a standard 35-mm still camera with f3.5 lens. Records are made by having the oscilloscope operating in sequence, opening the camera shutter on "bulb," firing the gun, and then closing the shutter.

The unit is a complete package of bridge elements, signal chopper, calibration system, amplifier, and power supply. Internal bridge elements handle either single-gage dynamic measurements or two-gage static and dynamic measurements. A switch clears the circuit for use of an entirely external bridge system connecting into the amplifier input.

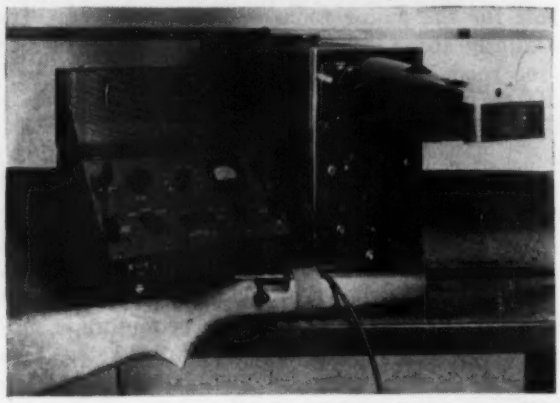


FIG. 2—The setup for measuring circumferential strain in gun barrels includes a strain gage, a cathode ray oscilloscope, and a 35-mm camera in addition to the strain amplifier.

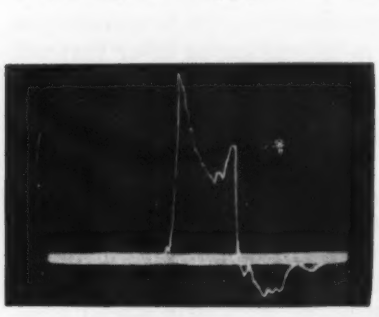
The signal chopper is a unique feature that indicates the static unbalance of the bridge by shorting the bridge output at 100 cycles per sec without affecting calibration. Static and low frequency components of the signal are shown when the signal chopper is on. High frequencies are observed when the chopper is off.

Calibration is Quick and Easy

Calibration can be checked readily at any time by using the chopper to connect a calibration-resistor across the active gage intermittently. Ten built-in precision resistors from 10,000 to 10,000,000 ohms cover the range of gages and signal amplitudes normally used. Binding posts provide for an external calibration resistor.

The amplifier reproduces all frequencies between flat 5 to 20,000 cycles per sec, the full range that is likely to be encountered in practical engineering work. Ample gain is provided to operate any standard cathode ray oscilloscope at the maximum usable sensitivity. Noise level is minimized by use of battery power, shock mounting and proper selection of components.

Microinches in strain can be determined by using graphed curves in the cover of the instrument. This is a calibration means for predetermining the amount of deflection in the oscilloscope beam from zero to several thousand microinches strain. This is advantageous in dynamic work because the speed of the trace deflection is too fast to read and interpret as it occurs.



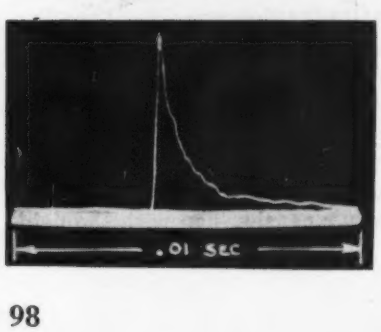
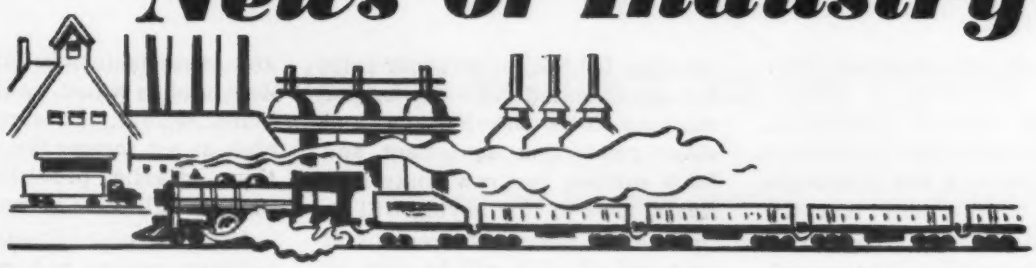


FIG. 1 — Photographic results of the strain amplifier measurements reveal typical oscilloscope patterns of dynamic stresses occurring within small fractions of a second.

News of Industry



End Not in Sight

Washington—A quick end to the Korean war was not in sight early this week. Men and materials are needed in greater strength than had been originally contemplated. The Air Force theorists are re-assessing their views on the decisiveness of air power alone and the job is rapidly passing into the hands of the slogging foot soldier.

Defense Secretary Johnson's economy program is out the window. Still, the effect on industry will be relatively slow and cumulative if the fighting is held within Korean boundaries. This is due to deliberate planning, including a careful size-up of potential trouble spots throughout the world.

Asks More Rubber Production

Detroit — Cautioning that the nation's supply of raw and natural rubber is too low for national security and the price too steep for economic stability, P. W. Litchfield, chairman of the board for the Goodyear Tire & Rubber Co., last week urged increased synthetic rubber production to 50,000 tons per month and the creation of a 200,000 ton rubber stockpile.

Plan TCI Tin Mill Extension

Birmingham — An extension to Tennessee Coal, Iron & Railroad Co.'s assorting room and warehouse at the Fairfield tin mill will be built, reports Robert Gregg, president. He said that it is likely a section of the space will be offered to the Continental Can Co. for processing its TCI plate.

Commerce Dept. Plans Steel Advisory Group

Soon to ask steel executives to serve . . . Dept. concerned over shortage complaints . . . May ask voluntary allocations . . . Official says action on steel may come—*By Gene Hardy.*

Washington—Control talk still comes from those who want to get the steel industry under the thumb of the Federal Government, irrespective of war or peace. In the Commerce Dept., however, which is concerned with steel supply problems in a serious, non-political manner, there is growing anxiety over the flood of complaints from steel users concerning their inability to obtain adequate supplies.

A high Commerce official told THE IRON AGE that "if there is only $1 billion more added to military expenditures within the next 4 or 5 months, or even a speed-up in the present rate of spending, the government will have to think about taking some action in regard to steel."

Steel Advisory Committee

While the military can be assured of steel supplies, there are many subsidiary activities classed as essential that have tough going in a tight market. This was adequately proved during the period in which the voluntary allocations law was in operation. The Commerce Dept. feels that a similar set-up would do the trick in another tight market situation, barring full-scale war.

That the government is taking a close look at the steel industry is definitely indicated by the Commerce Dept. finally taking action to establish an iron and steel advisory committee. The committee may be called shortly, perhaps even this week. The Commerce Dept. has not had a steel advisory group since voluntary allocations expired. The Munitions Board has a steel committee composed of top policy people in the industry.

Study Ore Transport

The Commerce Dept. committee will be composed of operating officials, those concerned with production, transportation, raw materials, etc. It will be consulted fully before any moves toward controls are made and it will be available to other government bodies, such as the National Security Resources Board. Other committees in such fields as machine tools and machinery will also be set up in the very near future. Meetings with such key industries are reported to have White House backing.

The Commerce Dept. is also speeding its plans for an interagency meeting with industry officials on transportation problems relating to iron ore. This is considered one of the major problems confronting the steel industry due to (1) the vulnerability of the Soo Locks, (2) the fact that foreign sources such as Venezuela are not yet ready—and vulnerable in any case, and (3) the belief in most government agencies that ore

shortages are now more real than fancied.

There is general agreement among such agencies as the Bureau of Mines and the Commerce Dept. that if the steel industry wants to utilize its full capacity next year, there will not be enough iron ore and that in succeeding years the situation will get worse until alleviated by foreign sources. A Bureau of Mines report to this effect has been circulated among high government officials.

Procurement Slow

Military orders have not yet begun to increase substantially as a result of the Korean fighting. Recent contracts for 17,000 military vehicles and $1.8 million worth of 30 caliber ammunition are part of the Army's regular procurement and would have been let in any case.

While it can be safely assumed that basic materials are available to support forces already under arms, any increase in the number of men would mean a quick boost in military procurement. Actual procurement as well as potential future orders are all having a substantial effect on supplies of steel and other short materials.

Foreign Aid Up

While military orders for U. S. forces may be slow in getting into industry's hands, this is not the case in regard to equipment for foreign military aid. The tempo of this program will increase rapidly. For the first year which ended June 30, $967.5 million was set aside for military equipment. For the current fiscal year the amount is estimated at $885.8 million. However, the bulk of this $1.8 billion will find its way into contracts this year, since the program got a late start.

The other portion of the military aid program, calling for equipment and raw materials to increase arms output in Europe, will also increase sharply. For the fiscal year, $5.8 million was allocated for machine tools and $11.1 million for raw materials. The program for the current year calls for an estimated $22.5 million for machine tools machinery and other production equipment and $45.5 million for raw materials. Again, most of this buying will be concentrated in the current fiscal year and all of it will be done in the U. S.

Military Priority

Military orders will naturally take preference. In fact, the draft law gives the President authority to order military orders filled on a priority basis, guarantees steel and other materials for such orders, and as a last resort, permits plant seizure. Procurement officials do not foresee the need to use these drastic provisions, again barring full-scale war.

Drafting of additional men for military service will mean manpower shortages in varying degrees. Of more immediate importance however is calling of reservists who will be drawn from the ranks of highly skilled persons in such fields as electronics, communications and transportation.

Voluntary Allocations Placed on Nickel

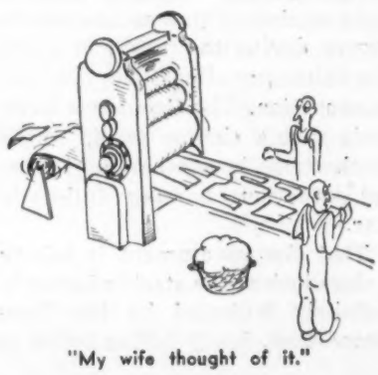
Causes buying spree for strategic scrap . . . Second quarter shipments at record rate . . . No early demand drop forecast . . . No shortage seen in nickel for arms program.

Philadelphia — Shipments of nickel to customers will be reduced during the last half of the year by voluntary action of the producer, International Nickel Co., it has been learned in trade circles.

News of this development, coupled with general knowledge of the effect of the war in Korea on strategic metals, has created a buying wave for scrap nickel and other strategic metals such as cobalt. Buyers are reported to be offering premiums above previously quoted prices.

Extra Heavy Demand

Demand on International Nickel Co. for primary nickel has been extraordinarily heavy ever since the last quarter of 1949. In the United States and Canadian markets, shipments in the last 3 months have reportedly been more than double those of the company's largest prewar year, 1939, and approximately 25 pct greater than in its largest postwar year, 1948.



"My wife thought of it."

Shipping Without Restriction

Since under present conditions an early reduction in demand seems unlikely, the company has found it necessary to start rationing its available supply. Reports indicate that nickel production by International Nickel Co. has been forced at maximum rate of capacity.

Shipments of cobalt, one of the first metals put under allocation by the government before the last war, are reported to have been exceedingly heavy for a long time. But principal suppliers here are said to be shipping readily without any restrictions on quantity or previous buying experience.

Producers of ferroalloys, including ferrochrome, are shipping freely to meet all demands. The ferroalloy market has been active ever since the latter part of 1949, reflecting the high rate of alloy steel production. Producers indi-

cate that there is no early prospect of restricted supplies unless demand should continue to increase at a very rapid rate.

Stainless Slowup?

The implications of the change in the availability of nickel point to a possible enforced reduction in the production of stainless steels containing nickel. Although no excessive demand has shown up yet for stocks of nickel for plating, the cutback in nickel shipments must eventually reduce the use of nickel anodes and salts for plating.

One thing is fairly certain. Even though the allocation program has been undertaken voluntarily by the company, nickel for armament production while the Korean war lasts will not be in shortage.

Holds Welding Course

San Luis Obispo, Calif.—Many phases of welding, including automatic submerged arc welding and wrinkle bending, were discussed and demonstrated to more than 100 students at a 3-day school recently concluded at California State Polytechnic College's campus here.

Lukens Marks 140th Anniversary

Coatesville, Pa.—The 140th anniversary of the founding of Lukens Steel Co. as the Brandywine Iron and Nail Factory where the first boiler plate in America was rolled was celebrated here on July 2.

Ordnance Orders 8350 Jeeps

Toledo — The U. S. Ordnance Dept. recently placed an order with Willys-Overland for 8350 M38 waterproof jeeps, valued at $22,291,330.

To Repay U. S. With Congo Tin

Washington—Under a contract signed with Belgium, repayment of $1.7 million in Marshall Plan funds for mining equipment will be made in the form of tin from the Belgian Congo.

New Rail Rate Effects Less Than Expected

Trend seen as gradual and rail officials voice optimism . . . Truckers lose less than expected . . . Rail strike and faster truck shipments seen as reasons—*by John B. Delaney.*

Pittsburgh — The eastern railroads' reduced rate on 80,000 lb carload shipments of iron and steel products has reversed the trend toward use of trucks, but not as much as had been expected.

Switch Not Impressive

A spot check of steel producers, truckers, and railroad officials revealed that while the rails have picked up some of the tonnage lost to highway haulers since 1942, the switch has not been impressive to date. The feeling is that since the reduced rate has been in effect only 2 months it may be too early to get a true picture. Some observers believe the trend is likely to prove a gradual one.

Several railroad officials have voiced optimism. Walter S. Franklin, president of the Pennsylvania said recently that the rate adjustments are bringing steel back to the railroads in "substantial" volume. However, a spokesman for the eastern railroads said he has not yet received any figures to confirm this view.

A leading iron and steel trucker said his tonnage loss since the reduced rail rate went into effect May 1 was not as great as he had feared. He said that business during June was off only 11 pct from May, which was an unusually good month because of a railroad strike. He said his experience was perhaps typical of the trucking industry as a whole.

These are the factors believed responsible for minimizing the swing back to the rails: (1) the May rail strike, (2) rate cutting by some truckers to meet the competition, (3) with steel demand tight, some consumers prefer to pay more for faster delivery by truck, (4) steel consumers whose customers include trucking companies are mindful of this fact. One who had switched back to rail quickly changed his mind when truckers jogged his memory, (5) a shortage of railroad gondolas.

Ahead Despite Strike

One Pittsburgh district mill reported that May rail shipments were 1.5 pct ahead of April despite the railroad strike. Another said that some customers who formerly specified truck have swung over to rail, but added that percentagewise the shift had not come up to expectations. Figures for June were not available.

The railroad rate reductions averaged 25 pct or more, and in most cases the new rates are lower than existing truck rates, averaging, according to a trucking source, 5¢ per 100 lb below the truck rate on 32,000 lb minimum shipments, applying to the same specified iron and steel items.

Here is a comparison of rail and truck rates covering the restricted list of iron and steel products:

From Pittsburgh	Rail 80,000 lb	Truck 32,000 lb
	Cents per 100 lb	
To Cleveland	20.5	26
To Toledo	30.0	35
To Detroit	35.0	40
To Dayton	35.0	40
To Columbus	27.0	30
To Akron	20.5	25
From Bessemer, Pa. to Cleveland	22.0	28.0

"... and we heard you've developed an improvement on an industrial process."

INDUSTRIAL SHORTS

OPENING MINE—Shaft-sinking operations at the Tracy Mine near Negaunee, Mich., owned by JONES & LAUGHLIN ORE CO., will start next fall. The mine is expected to produce a million tons of iron a year and the first shipments are expected by 1954.

ADDS 3 PLANTS — SOLAR STEEL CORP., Cleveland, has purchased the business of the Edgar T. Ward's Sons Co. Div. from the Columbia Steel Shafting Co. Solar Steel acquires the Edgar T. Ward plants in Cincinnati, Cleveland and Detroit which will be operated as Edgar T. Ward Divs. and will stock a complete line of general steel products. Robert Harwood has been named general manager of the Edgar T. Ward Div.

MORE PIPE—The United Concrete Pipe Corp., Baldwin Park, Calif., has been purchased by PONTUSCO CORP., Burlington, N. J. Pontusco is jointly owned by the U. S. Pipe & Foundry Co., East Burlington, N. J., and by Compagnie de Pont-a-Mousson of Nancy, France, and manufactures concrete pipe and associated products.

ACQUISITION — The controlling interest of the LEADER IRON WORKS CO., Decatur, Ill., has been acquired by Julius H. Peters, formerly associated with the Colonial Iron Works Co., Cleveland. The new officers elected were Julius H. Peters, president and treasurer; E. Donald Peters, vice-president; and Clarence J. Warner, secretary.

FIRST AWARD — THE IRON AGE received a first award among industrial papers for "editorial achievement during 1949" from *Industrial Marketing*. The award is for the "best original research" published during the year. The article, "Steel Distribution," was prepared by Oliver Johnson, director of research, THE IRON AGE.

BUILDING FURNACE — The erection of a blast furnace and coke oven has been announced by DOMINION FOUNDRIES & STEEL, LTD., Hamilton, Ont. A special general meeting of stockholders was held recently to approve the issue of 80,000 shares of stock to provide funds for the plant expansion.

SELLS SUBSIDIARY — The M. W. KELLOGG CO., refinery and chemical engineers of Jersey City and New York, has sold the stock and assets of one of its subsidiaries, the Kellex Corp., to the Vitro Mfg. Co.

DISTRICT OFFICE—A direct sales office has been opened at 10700 Puritan Ave. in Detroit by the TAFT-PEIRCE MFG. CO. Raymond F. Jalbert, district manager of the Detroit territory, has been assigned to the office and will be assisted by Richard Read.

NUMBER 8—A second Los Angeles plant will be constructed by the AMERICAN CAN CO. for the manufacture of food cans. Representing an investment of several million dollars, it will be the company's eighth plant in California and will provide employment for 400 to 500 men and women.

EXPORT SALES — Pennsylvania Transformer Co., Canonsburg, Pa., manufacturers of electrical distribution and power transformers, has appointed PHILIPS EXPORT CORP., New York, as their export sales representative. B. D van Eyck, manager, Industrial Equipment Div. of Philips Export, is in charge of the Pennsylvania account.

CHANGES NAME — The National Enameling & Stamping Co., Milwaukee, has changed its name to NESCO, INC. The change was made because their trade name "Nesco" was better known than their company name.

U. S., Britain, and Canada Agree on Bolt Standardization

New York—Following the standardization of screw threads in 1948, the United States, Great Britain, and Canada have agreed on a set of standards for hex heads and hex nuts. The system is actually a revised American standard and will not cause a major changeover in American industry.

On the other hand, British industry will have to make a larger shift. According to Sir Anthony Bowlby, head of the British committee, the changes will be made in a comparatively short time in the automotive and aircraft fields but will take considerably longer in the case of heavy capital equipment such as steam turbines.

Important in Wartime

The Canadian position is somewhat in between, since industry there has had to produce both American and British types.

Particularly stressed by Harry W. Robb, leader of the American technical delegation, was the point that standardization by these three allies would greatly facilitate military operations and repairs in the event of another conflict.

To Build 28 Steel Rail Bridges

Chicago — Construction of the Chicago, Burlington & Quincy RR.'s "Centennial Cut-off" in Northern Missouri, designed to shorten and greatly improve its Chicago-Kansas City main line, includes construction of 28 steel bridges and numerous pile trestles and culverts.

Work on the new Missouri line started last November, and is scheduled for completion next year.

From Red to Black

Detroit—Mueller Brass Co., Port Huron, has reported net profit of $697,858 for 6 months ended May 31, 1950. Earnings are equivalent to $1.31 a share. For the same period a year ago the company reported a net loss of $487,173.

New England Industry Booms in First Half of 1950

Boston—With employment rising, industry expanding, and building breaking all records, New England finished the first half with high industrial activity.

According to the New England Council, three firms have announced they are moving parts of their operations to New England, 26 more are expanding in the area, huge shopping centers are going up in three Massachusetts cities, and building permits issued in May were 119.6 pct over last year.

Good business is reported by New England's shoe, vacation travel, steel and power, pulpwood and lumber, textile and apparel industries. Non-agricultural employment went up 52,400 during April and May. It all spells good times for New Englanders.

To Teach Teachers

Hartford—Two 4-day instruction programs in the latest carbide tool practices will be presented to Connecticut trade and industrial school instructors at the Hartford Trade School this July. The program is sponsored by the Connecticut State Dept. of Educational Vocational Field Service and will draw teachers from the Carboloy Co., Inc.

Serves as Export Consultant

New York — B. S. Livingston, president of Livingston & Southard, an export firm, is now offering services as an "export consultant." In this capacity he will study products, analyze foreign markets, and make recommendations for American manufacturers who wish to start or increase export trade.

Announce New Truck Diesels

Harvey, Ill. — Three new "161 series" light weight diesel truck engines have been announced by the Buda Co. The new engines are said to cut fuel consumption, give off less smoke and produce more power.

No Mass Production Here

Cleveland—In order to take a picture of a star it is necessary for the telescope to track it across the heavens, holding it motionless on the photographic plate for a matter of hours. The precision with which this is done depends on the accuracy of the 720 teeth on the 7-ft diam right ascension worm wheel shown above being indexed.

Since conventional gear cutting methods were unsuitable, Warner & Swasey Co. specialists used the "gash" system in which each tooth is cut individually. The roughing cuts and the finish cutting, removing only a few thousandths of an inch at a time, required several days for completion.

The gear was positioned for each cut by microscope alignment of graduations on a finely divided circle, which was cut on a 40-in. automatic dividing machine designed and built by Ambrose Swasey over 50 years ago. This aging machine has a maximum error of only one second of arc, equivalent to one-third of an inch subtended at a distance of one mile.

The gear was made for a 24-in. Schmidt type telescope which was dedicated at the University of Michigan on June 22.

Introduces New TV Stainless

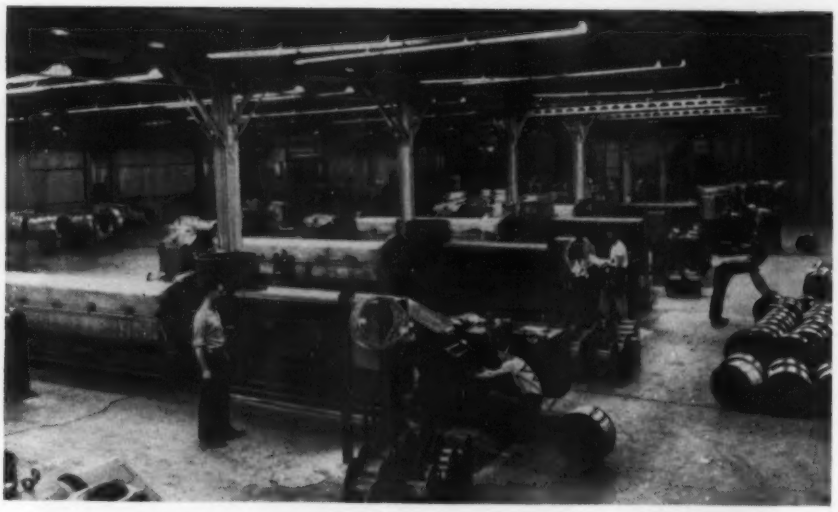
Middletown, Ohio—A new stainless steel for television tubes and other metal-glass applications has been announced by the Armco Steel Corp. Designated "Armco 430 ELC Stainless Steel," it is a ferritic alloy with a carbon content of less than 0.03 pct.

The reduced carbon content permits production of this type of chrome-nickel alloy without the use of expensive stabilizing elements, according to John A. Ingwersen, vice-president in charge of distribution.

Relight National Tube Furnace

Pittsburgh — Ending a 57-day shut down for major repairs, the largest iron producing blast furnace of National Tube Co., McKeesport, Pa., was re-lighted July 1. All of the company's four furnaces are now in operation.

Before its shutdown for relining, the furnace had been in continuous operation for almost 7 years, producing more than 2,100,000 tons of iron in an unbroken period of production dating to July 1, 1943. The furnace capacity is 1000 tons per day.



START OF OPERATIONS: Shown above are high-speed 1-die and 7-die tandem wire-drawing machines at the new Sheffield, Ala., cable plant of the Reynolds Metals Co. They reduce ⅜ in. aluminum redraw rod down to wire size desired in a single pass through the machine. Speeds run up to 5000 fpm.

Reynolds Metals $3 Million Aluminum Cable Plant Dedicated

Takes its place alongside existing mills . . . Aluminum walls used.

Sheffield, Ala. — Adjoining the Reynolds Metals Co. aluminum reduction plant and sheet and foil mills, a $3 million aluminum cable plant with an annual capacity of 60 million lb of electrical transmission line cable was dedicated on July 1.

Plant Equipment

Appropriately sheathed in aluminum, the building is 860 ft long and contains 145,000 sq ft of floor space. New redraw rod equipment is supplemented by five 10 die and one 7 die tandem wire-drawing machines which operate at high speeds when reducing ⅜ in. diam redraw rod to wire. Rod may be reduced to 0.0772 in. diam wire in a single run through the machine at a speed of 5000 fpm.

Other equipment includes 19 single-layer 7-bobbin stranding machines, a single-layer 12-bobbin machine, and a multi-layer 54-bobbin stranding machine. Small units operate at speeds up to 320 fpm. The 54-bobbin unit can work at 100 fpm. Hoists and a mono-rail system serve the stranders.

Special coil wrapping equipment eliminates conventional wooden reels even for shipping 1000 lb coils. A massive tensile testing machine has a capacity of 120,000 lb for pulling the rupture of the largest size cable.

Dedication speakers included Sen. Lister Hill; Sen. John Sparkman; Rep. Robert Jones; Gordon Clapp, TVA director and chairman; Richard S. Reynolds, Jr., president of Reynolds; M. L. Wilson, U. S. Department of Agriculture; J. Louis Reynolds, operating vice-president of Reynolds; E. C. Easter, vice-president of Alabama Power Co., and others.

Continues Spending for Plant

Pittsburgh—Allegheny Ludlum Steel Corp. will obtain $12 million from outside sources to help finance its new $23,600,000 plant improvement program, according to a statement in the company's quarterly report to stockholders. Presumably, the remainder will be provided from earnings.

The company expects to obtain the $12 million from a group of insurance companies on 20-year sinking fund notes.

When the new program is completed late in 1953, Allegheny Ludlum will have expended a total of $53,600,000 on plant improvements since 1946.

J. Calvin Brown Nominated As Head of Mechanical Engineers

New York—A Los Angeles industrialist, J. Calvin Brown, has been nominated for the 1951 presidency of the American Society of Mechanical Engineers and virtually elected since only one name for each office will be included in the Fall mail ballot.

Nominated on the same slate are regional vice-presidents: Henry R. Kessler, Republic Flow Meters Co.; Stephen D. Moxley, American Cast Iron Pipe Co.; Dr. John T. Rettaliata, Illinois Institute of Technology; Carl J. Eckhardt, University of Texas; and directors-at-large: Lionel J. Cucullu, New Orleans Public Service, Inc., and Harold E. Martin, Babcock & Wilcox Co.

New officers will take their posts after the ASME annual meeting set for December in New York. Mr. Brown will succeed James D. Cunningham, president of Republic Flow Meters Co., Chicago.

Good Chicago Business Continues

Chicago—The high level of Chicago area business continued into May, according to Leverett Lyon, chief executive officer of the Chicago Assn. of Commerce and Industry. Steel production and the number of contracts awarded on Cook County building projects were the two factors showing the greatest strength.

Construction contracts during May numbered 2211, representing the second highest point on record. The highest was in August, 1948, when 2756 contracts were let. During May of last year 956 contracts were let.

Scrap Men Tour Worth Plant

Claymont, Del. — Iron and steel scrap men toured the Worth Steel Co. plant here recently to see the processes which convert prepared scrap into steel. Mill officials explained the hazards to mill operations caused by improperly prepared bundles and by the inclusion of nonferrous metals in scrap.

Feelers for Galvanized Put Forth for Possible Bin Program

Government contemplates grain bin building . . . Would worsen shortage.

Pittsburgh — Galvanized steel producers have received tentative inquiries that indicate that the Federal Government is contemplating a new grain bin building program.

A large grain bin program, if warranted by a sizeable crop, would aggravate an already critical shortage of galvanized sheets. Sources here have the impression that the program may require substantial tonnages of galvanized sheets for bins to store surplus corn.

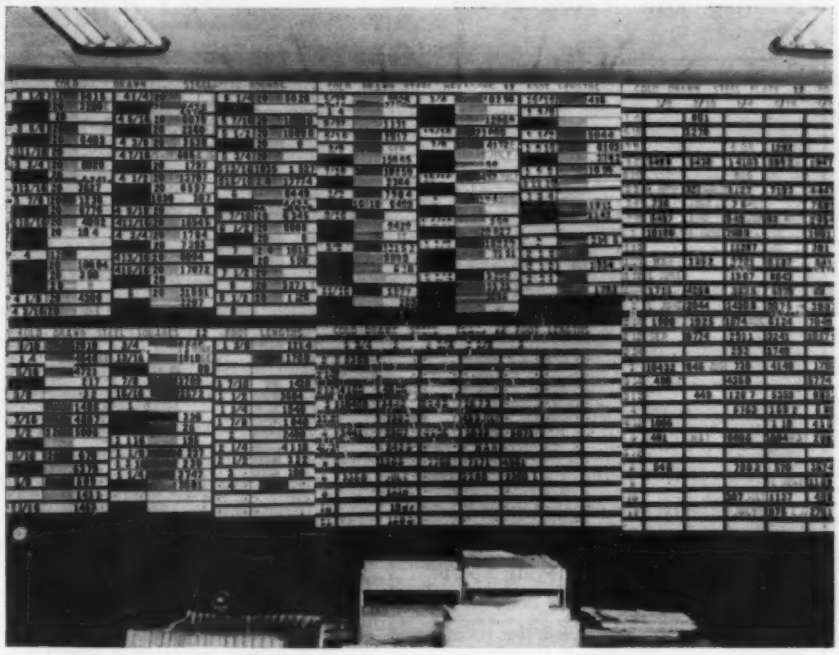
In Washington, Dept. of Agriculture officials noted that no "immediate" large program was in the books but indicated that one might be forthcoming in about 2 months. What their needs might be hinges on the size of the crop—now the unknown quantity.

Uncertainty Over Crop

If producers were to meet government requirements, the chances are that allocations of galvanized for non-government purposes would be curtailed. It would mean that much less for consumers of cold rolled sheets. Government preference for grain bin construction is galvanized sheets, but in the past other metals and even wood have been substituted.

Government officials met recently in Chicago to discuss a temporary corn situation which might result in a small program. Uncertainty over the crop outlook prompted Dept. of Agriculture officials to postpone a scheduled meeting with steel producers last week.

If their program is to be a large one, government officials must decide soon, say steel producers. It was pointed out that in less than 4 months the corn crop will be harvested and within that period, needed steel must be ordered, rolled and shipped to bin fabricators.



INDUSTRIAL SCOREBOARD: The A. R. Purdy Co., Inc., of Lyndhurst, N. J., uses this Planet Inventory System to keep up-to-the-minute and accurate tabs on the state of its stock. Telephone orders are expedited by the time-cutting process.

New Inventory Board Gives Current Listing of Purdy Stock

Jersey firm's order men can reply to phone queries within 1 min.

Lyndhurst, N. J. — In the front office order room of A. R. Purdy Co., Inc., is a huge board decked with white tags that has been mistaken by visitors as a railroad time table or a super scoreboard for sports results. It is the Planet Inventory System which gives a complete and up-to-the-minute listing of all 6000 to 7000 Purdy goods.

One Minute Answers

Before the innovation, order salesmen had to rummage through a multitude of cards and statistics to answer telephone queries. With the simple all-inclusive inventory, they can now reply to questions on stock and delivery dates in less than 1 min.

The size, in fractions, of each product is listed at the top of the board. The salesman selects the category and size. He then notes down the figure at the point where these two listings cross and has the amount of stock on hand and other facts pertinent to the order. A weight chart yields the accurate cost of an order and other information.

The delivery chart feature of the board includes all points to which Purdy trucks deliver and time of deliveries. Special arrangements are made if delivery dates prove unsatisfactory.

No Time Lag

The availability chart is another feature of the system. Information on inventory and delivery of material is given on the board—supplied by records maintained by a single stock clerk who keeps the board current. He deducts the quantity of a new order from its spot on the board as soon as it is placed.

Purdy reports that the new system of immediate recording obviates a former time lag of 2 or 3 days on inventory. If a certain type of stock was exhausted it took that long to discover the fact.

Now under consideration is a new feature for the board—a series of lights to blink on automatically when stock on a certain item goes below a set amount. This would serve as a guide to the purchasing department when stock is low and orders keep coming in.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

A New Era

THE commitment of American forces in a shooting war in far Korea seems in some ways like the beginning of an era. This is not an attempt of land-hungry Yankees to expand their dominion, to impose western dogma upon an oriental people, or shackle a new and unwilling satellite to our foreign policy.

To be sure, American troops have been used for limited quasi-police purposes before and having accomplished their mission been withdrawn. Decatur chastized the pirates off the northern coast of Africa. Perry crashed the Japanese barrier of isolationism. Pershing pursued Villa into Mexico. American forces helped to suppress the Boxer rebellion, and our marines landed in Haiti.

This is the first instance in modern history in which an organized international force, operating within the legal structure of a group of non-imperialist states, attempts by military force to protect the territory and preserve the independence of a country in which none of the participating members has even a remote "interest."

In the second place the action indicates that the international community, in spite of rather discouraging experience to the contrary during other similar common dangers in the past, has profited by such failures. The unqualified approval of this "police action" by Holland and Denmark is significant. Both are traditional neutrals. Neither is a great power with prestige and influence at stake. Denmark is in a particularly exposed position. Nevertheless both countries have stepped up and with singular courage and a refreshing absence of weasel diplomatic language have approved the use of force to slap down an aggressor on the other side of the world.

Furthermore, England, New Zealand, Australia, and Nationalist China promptly pledged manpower and materiel within their means to help the Americans in ejecting the North Korean invader. Only in the case of the Chinese may there be an element of direct calculation.

The fact is the Korean action marks the real beginning of the United Nations. For the first time there is evidence of a common interest in peace sufficiently powerful to transcend the more parochial objectives and the more limited urges of nationalism.

At home Korea marks the end of Acheson's policy of one-sided Communist containment. The notion that the holes in the Soviet bucket need be plugged only in the west and not in the east always seemed a fallacy of monumental puerility. The reluctant repudiation of its own eastern policy by the administration may mark the end of the blind and wilful coterie in the State Department responsible for the head start which the Reds now enjoy.

Finally, the outbreak of a shooting war just south of the 38th parallel raises profound questions regarding the American economy. Does this signify the end of any attempt to limit the budget, to cut taxes, to bring the dollar back to the safe anchorage of gold? Does it mean an aggravation of the business fever based on the effort of the American community to anticipate war? Does it mean the possible revival of rationing, price control? Worse still, may it re-endow an arrogant bureaucracy with the arbitrary power to push Americans around in their ordinary daily lives?

Bureau Installs New Mill

Washington—To expedite preparation of metallurgical specimens for its research program on the structure, properties, and behavior of metals and alloys, the National Bureau of Standards has installed a new 2-high 16 x 24 in. rolling mill. It takes 4 in. ingots or plate and is equipped for cold and hot rolling.

The mill will be used for a variety of studies, including melting and casting metals in vacuum, research on magnesium and aluminum alloys, the use of light metals for housing construction, and the properties of ferrous metals. A feature of the mill is a pair of internally steam-heated rolls which permit the rolling of magnesium alloys in a temperature range of 400 to 600° F.

To Build Pittsburgh Plant

Pittsburgh—Another steel consumer, Schwayder Brothers, Inc., Denver, Colo., has announced intentions to build a plant in this district. Manufacturers of luggage and folding tables from strip and tubing, the firm will erect a 200 x 250 ft structure in the West Mifflin Borough, near the Irvin Works of Carnegie-Illinois Steel Corp.

McCloskey Co., Pittsburgh, has been awarded the $500,000 building contract. Other new steel consumers here include Kelsey-Hayes Wheel Co., Continental Can Co., a General Motors stamping plant, and several smaller users.

Corrosion Course Scheduled

Cleveland — The Case Institute of Technology corrosion short course under the direction of Dr. R. B. Hoxeng will be held Sept. 25 to 29. Nine 2 to 2½ hr lecture periods with adequate time for discussion have been tentatively scheduled.

Among the lecturers will be F. L. LaQue, The International Nickel Co., Inc., New York; Dr. R. B. Mears, Carnegie-Illinois Steel Corp., Pittsburgh; H. A. Robinson, Dow Chemical Co., Midland, Mich.

Strikes, Tariff, Pricing Cause Copper Chaos

Price rise hinges on Congressional tariff suspension hearing . . . Korea has changed outlook . . . No price changes yet . . . New selling method set for August—*By John Anthony.*

New York—Strikes, tariff, and an important new development in the method of selling copper have combined to create a chaotic condition in the market. Buyers and sellers are perplexed as to the future course of the copper price.

Whether there will be a 2¢ rise in the copper market depends almost wholly on how soon Congress can enact and put into effect a tariff suspension measure. Meanwhile all factors are uncertain and waiting for the outcome of this week's tariff hearings to be held by the Senate Finance Committee and the House Ways and Means Committee.

Brass at Record

The war in Korea has completely changed the outlook for a tariff suspension measure and there is no longer any doubt that a suspension bill will be passed. It may be for only a 1-year period, or perhaps longer. But there will be no question in the minds of anyone, including the domestic mine producers, that foreign copper will be needed by this country to support an armament program.

Whether the price moves upward depends on timing. The principal factor in the copper market is the sustained period of extraordinarily heavy demand for copper fabricators' products. Except for the usual December letdown, brass and wire mill business has been at a record level since last September. April and May, the latest months reported, were record-breaking, in which copper consumption was 124,000 tons and 133,000 tons. Domestic mine output is at the rate of only 70,000 to 75,000 tons a month.

At the present time copper consumers are deferring payment of the tariff by holding imported metal in bonded warehouse. Early action on a tariff suspension measure would permit them to save the duty. But they cannot hold out without foreign copper very long, perhaps not more than a week or two.

Statistically speaking, the copper fabricators' supply position is very poor, with a deficiency in their copper stocks in May of 72,732 tons in comparison with the business booked. June and July statistics are expected to reveal greater deficiencies.

Last week only one vessel arrived with South American copper. Its contents went into bonded warehouse. So consumers have not yet paid any tariff and the market is still quotable at 22.50¢. If congressional action proves to be too slow, some of the fabricators will have to take their foreign copper, paying the duty and moving the market upward.

It would be impossible for the copper market to operate for any appreciable time on a split price basis. At current consumption rates, more than 40 pct of total domestic requirements must come from South America. This would involve discrimination between consumers even though producers of foreign copper made every effort to distribute domestic and foreign copper equitably to their own customers.

Strikes Cut Production

So far the brass mills have made no changes in the prices of their products. But if and when they have to pay the tariff, mill products will move up. The profit margin in the business is much too small to permit them to absorb the increased cost of copper. Meanwhile brass mill officials find themselves in the dilemma of determining how long they can do without foreign copper before their operations are affected.

The whole situation will be brought to a head more quickly

toughen metal

improve surface

end stock waste

The Torrington Rotary Swaging Machine delivers 4000 hammer blows a minute...reduces, sizes, rounds, points and tapers rod, wire and tubing . . . work-hardens metal for toughness and resilience...produces a burnished surface . . . utilizes every bit of stock.

Torrington Swager performance is based on our 42 years of swaging experience. Send the coupon for your free copy of the booklet illustrating the machines and describing the art of rotary swaging.

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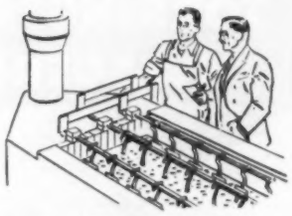

What! HIGH SPEED chromium plating?

The most important advance in chromium plating in 20 years, Unichrome S.R.H.S. Chromium plates faster than conventional solutions – in some cases cutting time in half. It also plates bright over a wider current range – assuring less "burning" and "missing" on irregular parts. Its self-regulation insures a more foolproof bath with less supervision.

Enduring rack protection in all plating baths

A green plastisol baking coating, Unichrome Coating 218X withstands severest plating cycles, including vapor degreasing. It does not contaminate plating baths. Uses a *single* prime coat. Technical help on application technique provided to assure longest-lasting job.

For a zinc finish that stays bright

Because it gives zinc plate a brilliant lustre, protects it from corrosion, and costs so little, Unichrome Dip Finish is being used extensively on refrigerator shelves today...as well as on other wire goods, die castings, screws, nuts, bolts.

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United Chromium Limited, Toronto, Ont.

because of strikes in the industry. The American Metal Co. refinery at Carteret, N. J., has been on strike for 2 weeks. Prospects for an early settlement are dim. Meanwhile 10,000 tons of refined copper a month will be lost. The strike of this refinery will aggravate the shortage of shapes needed by the mills.

The strike of switchmen on midwestern and western railroads caused a tie-up of operations at the Garfield, Utah, refinery of American Smelting & Refining Co. and held up shipments out of the Great Falls, Mont., refinery of Anaconda. Recently there was a 20-day strike at Anaconda's Chuquicamata, Chile, mining property.

New Price Basis

In addition to the uncertainty over the tariff, a new factor has come into the picture to unsettle the fabricator price set-up. Kennecott Copper Corp. announced last week that all sales of domestically produced copper for delivery in the United States would be made on a uniform delivered price basis effective for August deliveries. Other producers and custom smelters will continue to sell on the basis of Connecticut Valley delivery with freight additions to or deductions from the basing point, and ⅛¢ higher for Midwest delivery.

This development emphasizes a long-range trend in the industry. It reflects the movement westward of copper consuming industry during the war which has continued in the postwar period (THE IRON AGE, Dec. 30, 1948, p. 88). The postwar high freight rates have accelerated this trend.

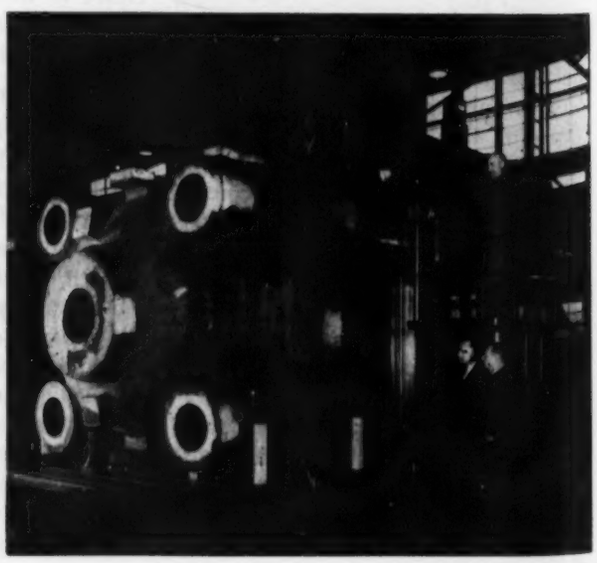
The Kennecott refinery, being built at Garfield, Utah, is expected to be ready for production early this fall. Other western refineries include those of Anaconda at Great Falls, Mont.; Phelps Dodge at El Paso, Tex.; and American Smelting & Refinery Co. at Tacoma, Wash., and Garfield, Utah.

Others Must Adhere

In a more competitive market, other copper producers will be forced to adhere to the delivered price system if they wish to serve the Midwest and western markets in competition with Kennecott. The delivered price system will also afford a competitive advantage to Kennecott throughout large sections of the East.

Once other producers have converted to a delivered price basis, copper consumers and their customers all over the country will gain the benefit of lowest price, now reserved to Valley mills alone.

But in the meantime, fabricators buying from Kennecott, except those in the Valley, will have a decided price advantage over their competitors. To many this will be a bitter pill to swallow, the brass business being as competitive as it is.



JUMBO: This massive 97,500 lb cast steel cylinder for a hydraulic press is being machined on what is reportedly the largest planer type boring mill ever built. The 8-in. bar type mill was installed in the plant of the Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio. In the foreground are Howard M. Hubbard, president, and E. V. Crane, chief engineer.

SKF RACES *Against Time...*

with the new

GISHOLT NO. 24 HYDRAULIC AUTOMATIC LATHE

When it comes to fast production of top quality spherical roller bearing races, SKF doesn't fool.

These new Gisholt No. 24 Hydraulics remove 34 lbs. of metal in two operations in a total of only 2.80 minutes' machining time on each of two machines. All cutting is on 52100 bearing steel and done at speeds of 325 to 350 f.p.m.

Speed is important, of course. But precision is the governing factor. How the Gisholt No. 24 does the job is a story that might mean real savings for you, too.

The No. 24 Hydraulic Automatic Lathe is a larger version of the famous No. 12 that has an outstanding success record on hundreds of jobs. If you have large volume precision work up to 24" diameter, the Gisholt No. 24 is the machine to investigate. Write for full information.

GISHOLT MACHINE COMPANY
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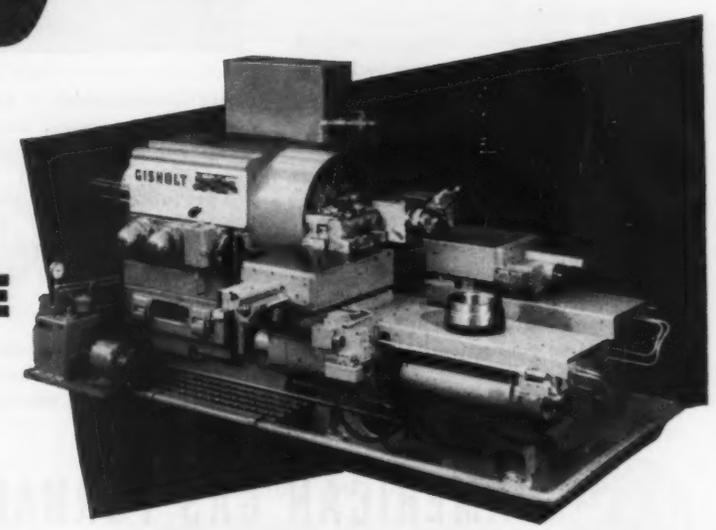
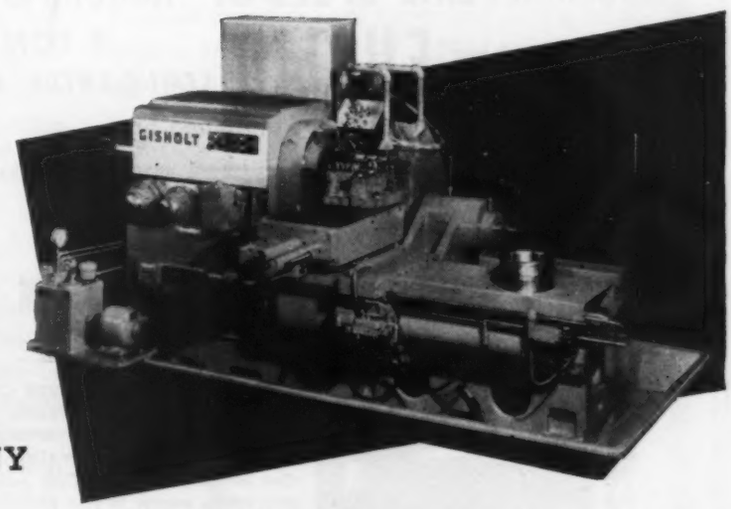
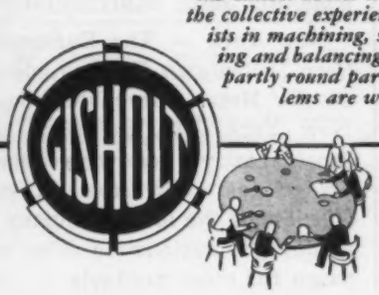


First Operation: Chucked on OD with 3-jaw hydraulic chuck, part is turned up to the jaws, faced, chamfered, bored and bore radius formed. Cam relief on rear tool block turns boring bit clear of workpiece as it is withdrawn.



Second Operation: Part held on expanding arbor by hydraulic pressure is finish turned, faced, chamfered and bore radius formed. Special rocker arm type carriage at rear tips in shaving tools to form both roller grooves with feed of .003" to .0045."

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*



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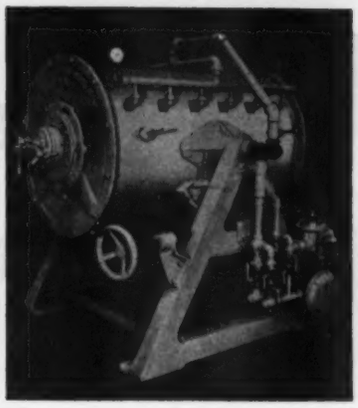
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

ROTARY GAS CARBURIZERS

A "First" by A.G.F. Co.



Versatility is the outstanding characteristic of AGF Rotary Gas Carburizing Furnaces, which may be used not only for carburizing, but also for clean hardening, normalizing, annealing, and other general or atmospheric work without modification to the furnace of any kind.

Uniform heating of the work is assured by the gentle mixing produced by the rotary action of the retort, which is heated by numerous carefully distributed and balanced gas burners. Carburizing or atmosphere gas is introduced through a simply-designed, trouble-free connection.

Charging and discharging of the work is accomplished by means of a tilting feature, which is power-driven on the larger models. The retort remains within the heat at all times.

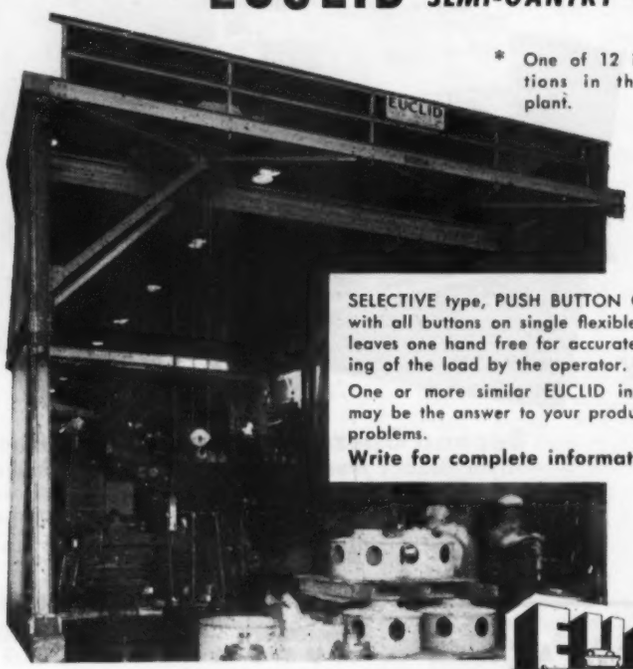
The furnace shown above is the latest, improved AGF Rotary Gas Carburizer, batch type, with new maintenance-free roller bearing retort support.

AGF gas carburizing equipment also includes Continuous Rotary Furnaces and Vertical Retort Carburizers. Write for literature.

AMERICAN GAS FURNACE CO.
1004 LAFAYETTE ST., ELIZABETH, N. J.

ASSEMBLY LINE "SPEED UP" ACCOMPLISHED
WITH THE AID OF THE EUCLID 3 TON SEMI-GANTRY* CRANE

* One of 12 installations in the same plant.



SELECTIVE type, PUSH BUTTON CONTROL with all buttons on single flexible pendant leaves one hand free for accurate positioning of the load by the operator.

One or more similar EUCLID installations may be the answer to your production line problems.

Write for complete information.

THE EUCLID CRANE & HOIST COMPANY
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EUCLID CRANES AND HOISTS
Raise Profits

• *News of Industry* •

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

1090 **Tons,** Madison, Wis., University Memorial Library, to American Bridge Co.

500 **Tons,** Chicago, Well Street Approach to Roosevelt Rd. viaduct.

280 **Tons,** Chicago, Building for R. Cooper, Jr., Inc., to American Bridge Co.

190 **Tons,** Rugby, N. D., Bureau of Reclamation Substation, Spec. 3071, to American Bridge Co.

185 **Tons,** South Bend, Ind., Stockhouse for Drewrys, to Elkhart Bridge and Iron Co., Indianapolis.

Fabricated steel inquiries this week included the following:

1350 **Tons,** Trenton, Nebr., Bureau of Reclamation, C B & Q Relocation Spec. 3113, bids due Aug. 8.

Reinforcing bar awards this week included the following:

1500 **Tons,** Chicago, Apt. Bldg., Lake Shore Drive and Barry Ave. to Joseph T. Ryerson and Son, Chicago.

990 **Tons,** Chicago, Parkway Garden Apts., South Park Ave., to Joseph T. Ryerson and Son, Chicago.

620 **Tons,** Chicago, Sheridan Tower Apt., to Joseph T. Ryerson and Son, Chicago.

525 **Tons,** Cleveland, Naca Equipment Storage and Building, to Paterson-Leitch Co., Cleveland.

280 **Tons,** Mineral County, W. Va., Keyser McCool Bridge, to Ben-Tom Supply Co.

215 **Tons,** Chicago, Alcon Corp. apt. building, to Ceco Steel Products Co., Chicago.

200 **Tons,** Gary, Ind., Budd Corp. superstructures, to Bethlehem Steel Corp.

Reinforcing bar inquiries this week included the following:

1500 **Tons,** Minneapolis, St. Anthony Falls Lock and Dam.

390 **Tons,** Chicago, Foster Ave. Bridge.

380 **Tons,** Milwaukee, Hummal and Downing Co. building.

350 **Tons,** Allegheny County, Pa., Pennsylvania Turnpike Section 31-A.

195 **Tons,** Chicago, apartment building on S. Everett Ave., Chicago.

170 **Tons,** East Cleveland, Ohio, Monticello Belviour Culvert.

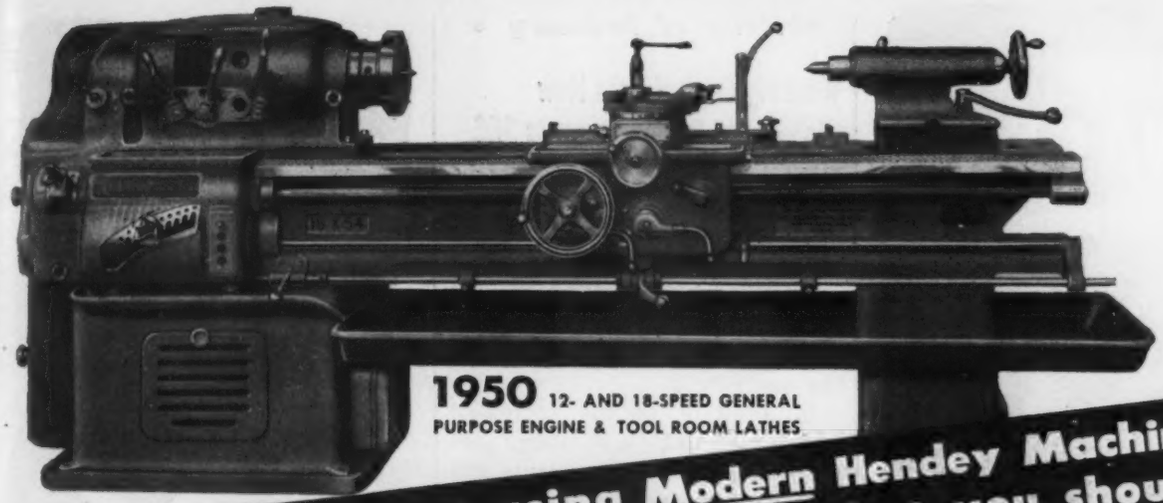
115 **Tons,** Joliet, Ill., alteration to east cell house State Penitentiary.

110 **Tons,** Terrace, Pa., Terrace State Hospital Employee Building and Tunnel.

100 **Tons,** Moline, Ill., Illinois Bell Telephone Co.

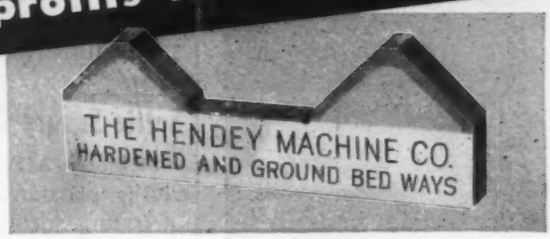
Appoints Sales Representative

New York — The Enamelstrip Corp., Allentown, Pa., has appointed the Metal Purchasing Co., of New York City, exclusive sales representative for their line of pre-painted strip steel in coils. Officials of the latter company are planning a nationwide sales campaign for these products.



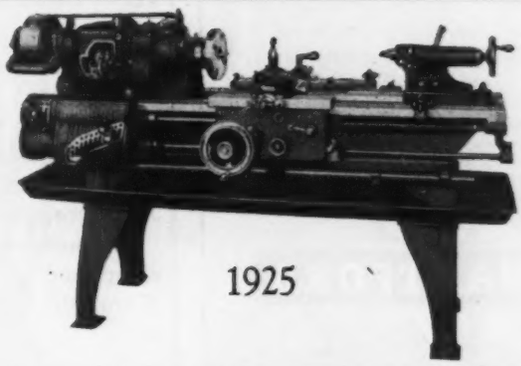
1950 12- AND 18-SPEED GENERAL PURPOSE ENGINE & TOOL ROOM LATHES

. . . If you are not using Modern Hendey Machines you are not earning the profits that you should!



Hendey Engine and Tool Room Lathes have been, and always will be, tops for accuracy. But, are you aware of the many other modern features of the new Hendey line? Like all Hendey Lathes, the 12- and 18-speed now have induction hardened and precision ground bed ways for both carriage and tailstock. Every important unit has fully automatic lubrication. The rear end of the spindle is graduated for indexing when cutting multiple threads, and there are 36 thread and feed changes. The precision, all-geared headstock is powered from a built-in motor in the cabinet leg. Spindle speed ranges from 19-1000 R.P.M. A choice of cam lock or long taper key drive spindle noses. Modern Hendey Tool Room Lathes are available with swings of 9", 12", 14", 16", 18", 20" and 24". Write today for full details and complete specifications.

This 8-speed Hendey Engine Lathe has long been obsoleted by the all-new Hendey 12- and 18-speed lathes. The 8-speed bed is not hardened and precision ground. Maximum spindle speed is only 426 R.P.M. Although a masterpiece of design and construction in its day, the 8-speed has been replaced by progressive manufacturers, because the 12- and 18-speed offer every modern improvement necessary to earn maximum profits.



Continuous, advanced engineering by Hendey is worth watching — and must be watched if you are to earn full profits from your lathes and shapers. For complete particulars and prices, contact your nearest Hendey office.

MODERN Hendey

THE HENDEY MACHINE COMPANY
MAIN OFFICE & PLANT: TORRINGTON, CONN.
BRANCH OFFICES: New York, Chicago, Boston, Detroit, Rochester, Los Angeles, San Francisco
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SWAGERS
save time and material on turning operations

Round work can be tapered, reduced etc. on Hartford Special Swagers much faster than by turning, hollow milling or other methods. No material is removed during swaging; strength and hardness of material is increased; a finer, smoother finish is imparted.

Hartford Special Swagers feature hardened and ground liners in die slot of spindle for longer wear of operating parts. All swagers equipped with stop rods to assure even opening of die along entire length.

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2

• *News of Industry* •

Working Capital Sets New High of $69 Billion, Reports SEC

Washington — An estimate by the Securities & Exchange Commission showed the net working capital of American corporations at a record high of $69 billion at the end of first quarter 1950. This was an increase of $1.3 billion for the quarter.

In addition to the increased working capital, corporations also invested $3.4 billion in plants and equipment during the quarter. Liabilities decreased during the period by a half-billion to a total of $55.8 billion.

Settle Square D Strike

Detroit—A 2-year contract providing pensions of $130 monthly, including Social Security, after 35 years of service plus full insurance and hospital coverage for pensioners has ended a 6-week strike at the Square D Co., an electrical supplier.

The new agreement also provides for a general wage increase of 4¢ per hr retroactive to April 3. Another 4¢ wage hike becomes effective June 4, 1951.

Workers with 15 years' seniority will be entitled to 3-week vacations.

TEMA Holds 1950 Elections

New York—At the recent annual meeting of the Tubular Exchanger Mfrs. Assn., Inc., the following were elected to office: C. H. Currier, president; W. C. Beekley, vice-president; George P. Byrne, Jr., secretary-treasurer.

The new executive committee is comprised of T. H. Miley, G. A. Worn, Mr. Currier, and Mr. Beekley.

Install Heat Treating Unit

Cleveland — Its $130,000 heat treating installation for large landing gear forgings has been completed by the Cleveland Pneumatic Tool Co. The new equipment has about double the capacity of the largest single furnace previously in use here.

SKILSAW CUTS DOWN-TIME AND TOOL GRINDS 75% with Stuart's SPEEDKUT

Multi-Purpose Cutting Fluid Saves on Machining Worm Gears

MATERIAL: Stressproof No. 2
MACHINE: Acme Gridley 2" RB-6
SPEED: Spindle speed 443 (116 pcs. per hr.) Surface feet 123
FEED: Form Tool .0012 (.499 core drill .0064 feed)
TOOL LIFE: 12 hours between grinds
CUTTING FLUID: 1 part SpeedKut B to 6 parts paraffin oil
COST APPRAISAL: Savings resultant equal 75% less machine downtimes; also 75% less tool grindings
NOTE: Machine is now made available to more production within its capacity.

THE FIGURES above speak for themselves. Skilsaw, Inc., noted as being one of the most progressive and cost-conscious manufacturers in the metal-working field, selected Stuart's multi-purpose Speed-Kut B for three operations (automatic screw machine, spline broaching, hobbing) on worm gears after placing it in direct competitive tests with other cutting fluids. SpeedKut B is applied straight on the broach while a 6 to 1 dilution is used on the other two operations.

Your Stuart Representative's business is COST REDUCTION. Ask him to call and show you how he can help you.

WRITE FOR D. A. Stuart's booklet, "Cutting Fluid Facts" . . . a guide to better machining.

D. A. Stuart Oil Co.

2737 S. Troy St., Chicago 23, Ill.

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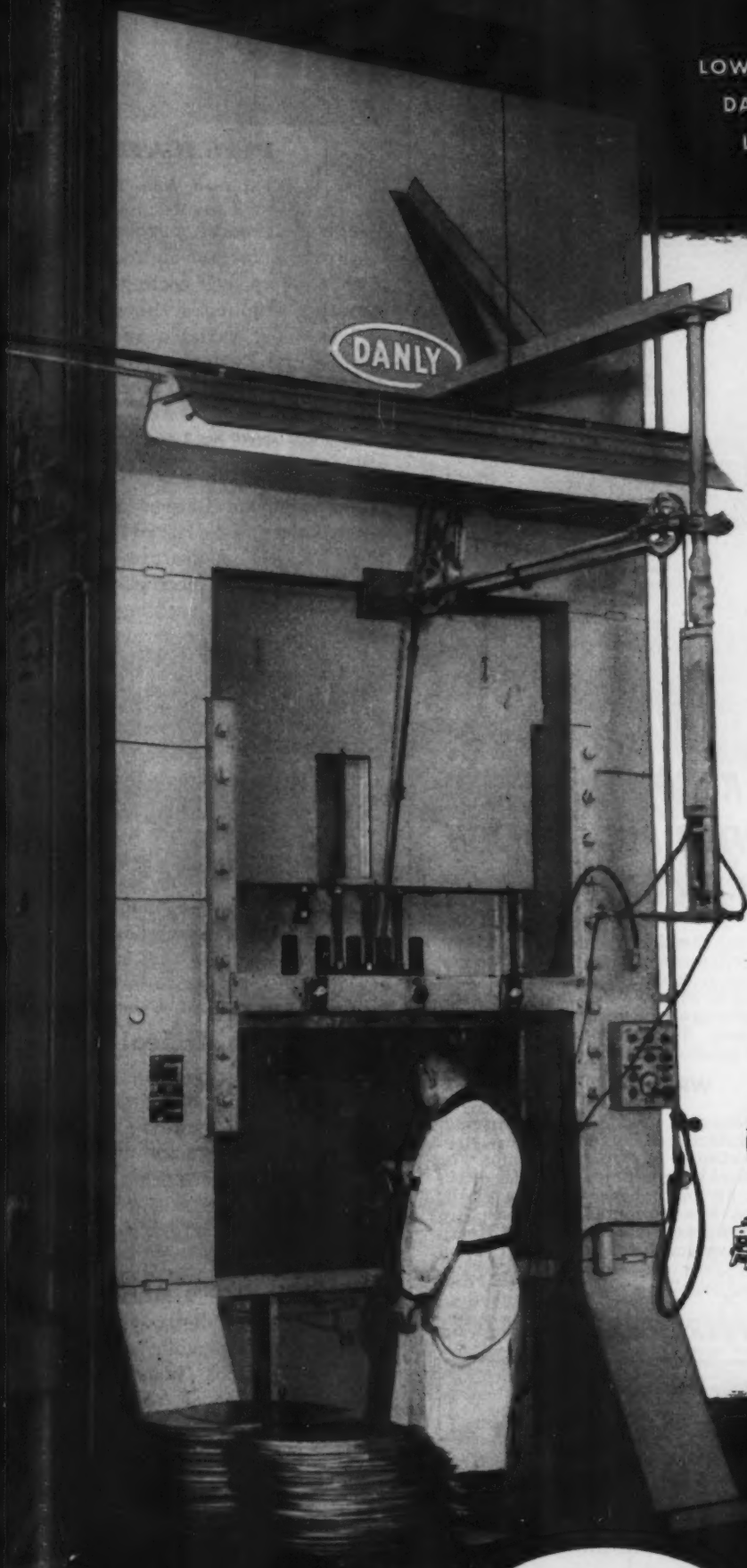
LOW OPERATING COSTS AND DEPENDABLE
DAY IN AND DAY OUT PERFORMANCE,
LEADING MANUFACTURERS SPECIFY



DANLY PRESSES

... the key to stamping economy!

On mass-production lines and under exacting precision stamping requirements, Danly presses are establishing new performance records. Outstanding improvements in press engineering, design and construction assure longer uninterrupted production runs, increased die life and greater operating safety.

The new Danly clutch alone, designed to combat heat, major cause of press clutch wear, is proof of Danly press engineering leadership. Other outstanding features include complete pressure lubrication and a specially designed press control system. Write today for specific information on the advantages of Danly Presses in *your* plant.

Send for this new Danly Straight Side Press Catalog

*The 175 ton straight side DANLY press shown is located in the new A. B. Dick plant, manufacturers of mimeograph office equipment.

MECHANICAL PRESSES . . . 50 TO 3,000 TONS

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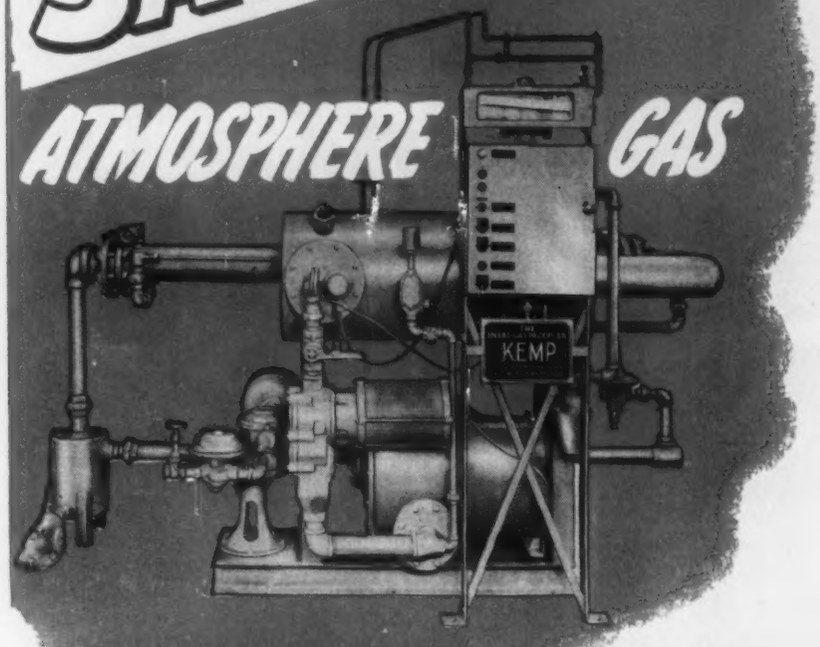

2 NEW COMPACT KEMP ATMOSPHERE GENERATORS OFFER PUSH BUTTON STARTING, FOOL-PROOF OPERATION

IF YOU need a compact source of atmosphere gas, *save time and money*, specify Kemp! Two new Kemp Atmosphere Generators (models MIHE-1 and 2) deliver 1000 and 2000 cfh respectively. Both offer all features of larger equipment: push button starting, automatic fire check, flow meter, etc. . . and assure that you get *same analysis* gas from 1% to 100% of capacity.

FOOL PROOF OPERATION

Kemp Generators burn ordinary gas just as it comes from the mains. A famous Kemp Carburetor, part of each installation, assures *complete combustion* without "tinkering" to produce a clean, chemically inert gas containing 88% nitrogen, 12% CO^2 . . . a gas so pure it is used *without further processing* in copper annealing and in the manufacture of *aspirin* and *laboratory chemicals*, fine paints and a host of other products.

WRITE FOR DATA

Whether you need inerts for purging, fire protection, blanketing or any steel application . . . specify Kemp. For technical information write for Bulletin 1-11. *To find out how you can benefit:* tell us how you produce atmosphere gas now; we'll show you how Kemp can solve your problem. *Mail Coupon today!*

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OF BALTIMORE

CARBURETORS
BURNERS
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THE C. M. KEMP MFG. CO., Dept. C-7,
405 E. Oliver St., Baltimore 2, Md.

Gentlemen: Send me information on Kemp Generators. I am interested in Bulletin 1-11; data on larger equipment.

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Company .....
Address .....
City ..... Zone ..... State .....

FREE

PUBLICATIONS

Continued from Page 34)

contained general purpose units feature a motorized high speed hydraulic pump, self-cooling oil circuit that eliminates the need for cooling coils, variable speed control, rapid return speed and greater production. *Beatty Machine & Mfg. Co.*

For free copy insert No. 9 on postcard p. 35.

Air Cylinders

The complete line of Lindberg air cylinders is described in a new 16-p. booklet. A feature of these cylinders is the 1-piece piston with synthetic "Vee" packings which simply snap into the piston groove, as explained in the catalog, *Lindberg Engineering Co.*

For free copy insert No. 10 on postcard p. 35.

Electrical Connectors

The standard line of Joy molded Neoprene rubber electrical connectors are described in a new 8-p. illustrated bulletin. Other associated equipment such as lamps, sockets, distribution centers and vulcanizers are also shown, and the advantages of each are fully explained. *Joy Mfg. Co.*

For free copy insert No. 11 on postcard p. 35.

Improved Shaft Seal

The Gits Unit Seal, designed to eliminate shaft sealing problems, is described in a new 4-p. folder. Principles of design are presented, with cutaway illustrations to show method of operation and installation. *Gits Bros. Mfg. Co.*

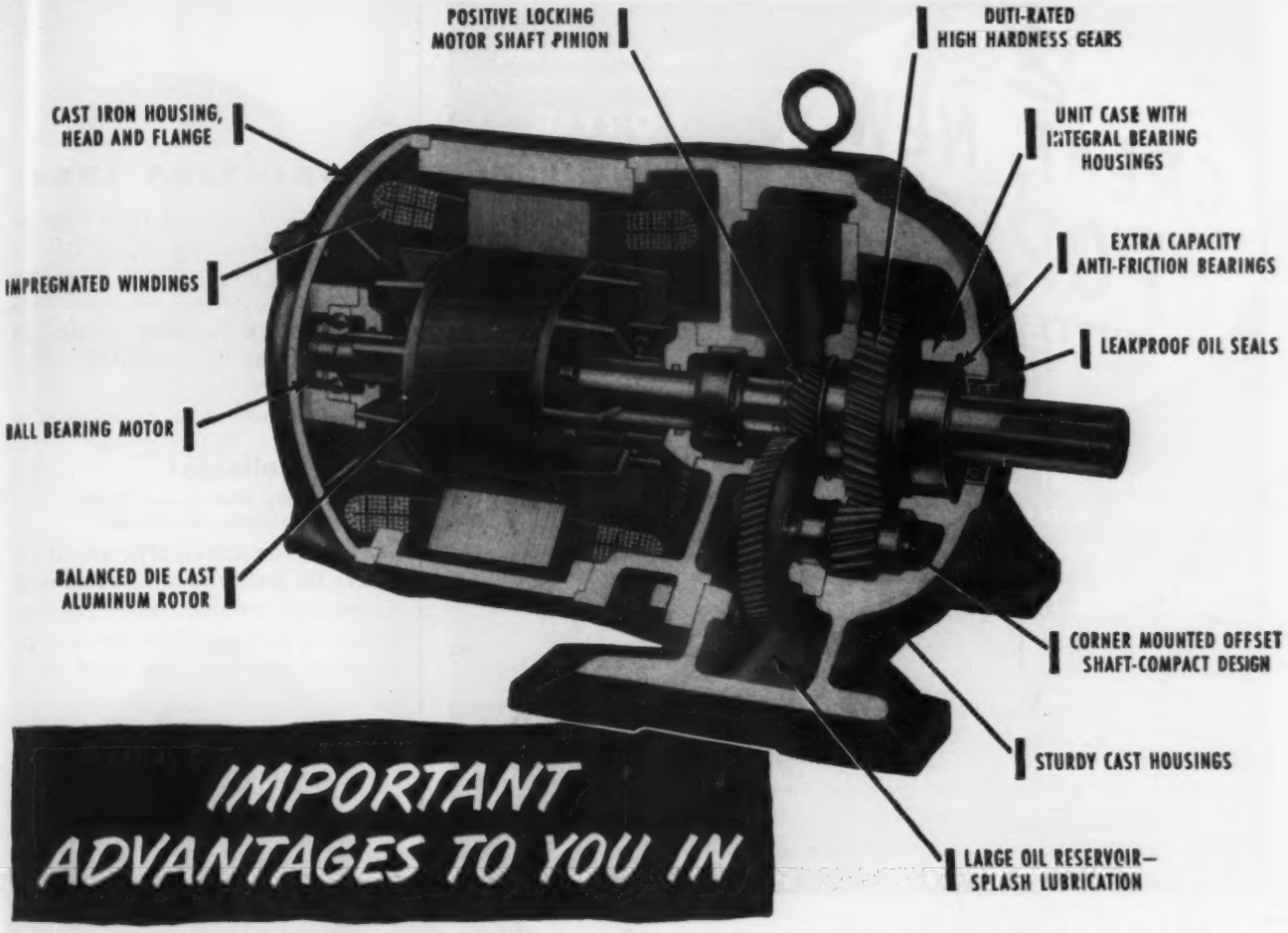
For free copy insert No. 12 on postcard p. 35.

Chrome Plating Anodes

A new 4-p. bulletin points out that only the Republic anode has the copper hook homogeneously burned to the anode, and that the bond formed by the Republic lead process is so tight that the lead actually contracts with the copper, assuring a positive electrical contact for the entire life of the anode. *Republic Lead Equipment Co.*

For free copy insert No. 13 on postcard p. 35.

Resume Your Reading on Page 35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CAST IRON HOUSING, HEAD AND FLANGE
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EXTRA CAPACITY ANTI-FRICTION BEARINGS
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BALL BEARING MOTOR
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Foote Bros.-Louis Allis Gearmotors offer you these advantages:

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They are available in single, double and triple reductions in output speeds of 780 down to 7.5 r.p.m. Ratings range from 1 h.p. through 75 h.p. Open drip-proof, splash-proof, enclosed and explosion-proof motors are available.

These gearmotors have sturdy cast housings, streamlined inside and out. Precision helical gears have file-hard tooth surfaces and tough, resilient cores, giving long life and maximum load carrying capacity. Mail the coupon for bulletin GMA.

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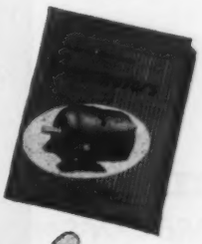
Bulletin GMA giving complete rating tables and sizes sent on request



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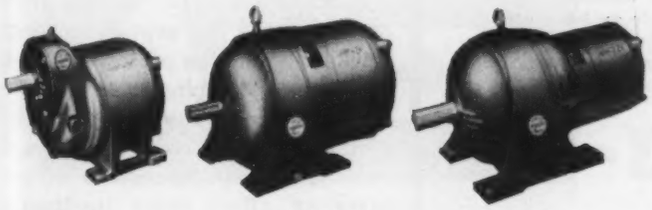
Better Power Transmission Through Better Gears



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Gentlemen: Please send me a copy of Bulletin GMA with information on Foote Bros.-Louis Allis Gearmotors.

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Company.....

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City..... State.....

2 GREAT, NEW PORTER CUTTERS

for cutting extremely hard materials, including stainless steel

PORTER CARBIDE EDGED CUTTER

Another important Porter development for cutting extra hard materials, such as stainless steel rods, wires, pins, etc. Tough carbide edges are firmly brazed to cutting jaws. Stands up under the toughest usage! Pays for itself many times over. #3CE cuts up to 5/16 dia. #4CE cuts up to 3/8 dia.

for cutting hot steel bars, rods, wires, etc.

PORTER HOT METAL CUTTER

An ideal tool for steel mills and fabricating plants. Made of special hot work steel and special heat-treated jaws, for long life under continuous heavy duty with no loss to cutting edge temper.

#3HW cuts up to 5/16 dia. #4HW cuts up to 3/8 dia. Order through your industrial supply house!

H. K. PORTER, INC., 74 Foley Street, Somerville 43, Mass.

The HALLOWELL FOREMAN'S DESK OF STEEL

HALLOWELL Steel Desks pay dividends in convenience and durability. Made of steel, these units take years of abuse without losing their trim appearance. The smooth, firm writing surface stays that way. Drawers glide easily on ball bearing rollers. Built-in locks protect prints, papers, instruments, etc. No protruding handles to catch clothing or pull off. Choice of several models for varied purposes. Full details in Bulletin 728.

SHOP EQUIPMENT HALLOWELL OF STEEL

SPS STANDARD PRESSED STEEL CO.
JENKINTOWN 17, PENNSYLVANIA

NEW

PRODUCTION IDEAS

Continued from Page 38

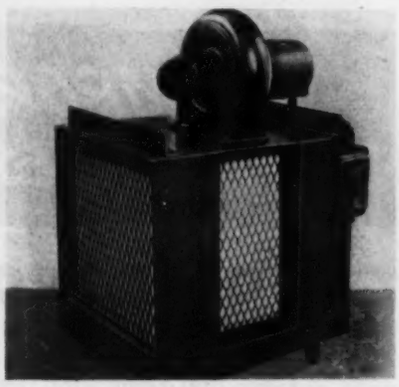
gage metal lath, cutters have special designed center cut jaws with pointed noses to allow cutting in narrow places. Capacity is 3/16 in. *H. K. Porter, Inc.*

For more data insert No. 28 on postcard, p. 35.

Vapor Collector

Cleans oily mist around high speed machining operations.

The motor driven attachment removes the particles of oil from mist emanating around machines engaged in high-speed machining operations where oil is used as a



coolant. The attachment consists of a motor-driven fan mounted on a dispersing tank. Oil-laden air is blown into the tank where it disperses over three outlet filters. The oil is collected on renewable filter pads where it drains to the base of the tank. The attachment can be suspended from the ceiling or placed on the floor. *Brown & Sharpe Mfg. Co.*

For more data insert No. 29 on postcard, p. 35.

Black Metal Coloring

Deep black protective finish for iron and steel products.

Atomite is a metal coloring process developed to provide a deep black rust resisting protective finish for metal stampings, screw machine products, wire products, springs, castings, etc. Atomite will not change the dimensions of the parts or affect those previously heat treated to 300°F, it is stated. No special equipment is required.

Built to match the POWER of your impact tools

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Apex impact sockets and wrenches are designed for continuous, heavy-duty industrial service, and built to stand up under the strains and shocks of impact tool operation . . . to minimize tool wear-out and breakage.

Select the impact sockets and wrenches you need for efficient production from the thousands of standard types and sizes available for prompt delivery from complete Apex stocks. Special applications? Just send your sketch or blueprint—we'll furnish quotations, without obligation.

A note (on your company letterhead, please) will bring your copy of Catalog 19, a complete listing of all Apex plain and universal sockets, extensions and adapters.

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There are thousands of instances where forgings have reduced the cost of parts at the point of assembly. This booklet containing 60 pages of authoritative information on forgings formed to close tolerances by use of closed impression dies tells how cost reductions may be obtained. Forging production techniques are described and illustrated.

Forgings provide rapid assembly of complex parts by welding adaptability of widest range; forgings permit reduction of dead weight because maximum strength and toughness are obtainable in lighter sectional thicknesses; forging to shape avoids waste of metal and reduces machining and finishing time-cost. The metal quality and cost-reducing possibilities obtainable in forgings cannot be equalled or duplicated.

Recheck every stressed part in your equipment, as well as simple handles and levers, and consult a forging engineer about possibilities for reducing costs at the point of assembly. Only a forging engineer can inform you fully regarding the numerous advantages obtainable with forgings. Your copy of this reference booklet on forgings is available now. Attach coupon to your business letterhead.

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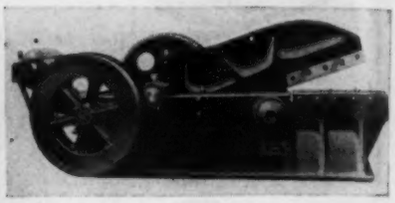
Coverage on flat surfaces is estimated at 250 sq ft per lb of dry Atomite. *Atomite Black Co.*

For more data insert No. 30 on postcard, p. 35.

Alligator Shear

All steel construction; self-contained; no foundation required.

This new shear, designated as the Canton 44A, is heavier, more powerful, and has greater capacity



than the No. 3 shear now in use. Capacity is 4¼-in. rounds or 1x30-in. plates in mild steel. The shear is made in high and low knife models in right or left hand styles. *Hill Acme Co.*

For more data insert No. 31 on postcard, p. 35.

Under-Car Unloader

Unloads sand, gravel, crushed stone at rate of 3 tons per min.

A new combination belt and positive chain drive hopper bottom car unloader has been developed for

handling aggregates such as sand, gravel, crushed stone and any material loaded in hopper bottom cars. Capacity of the machine is up to 3 tons per min. *George Haiss Mfg. Co., Inc.*

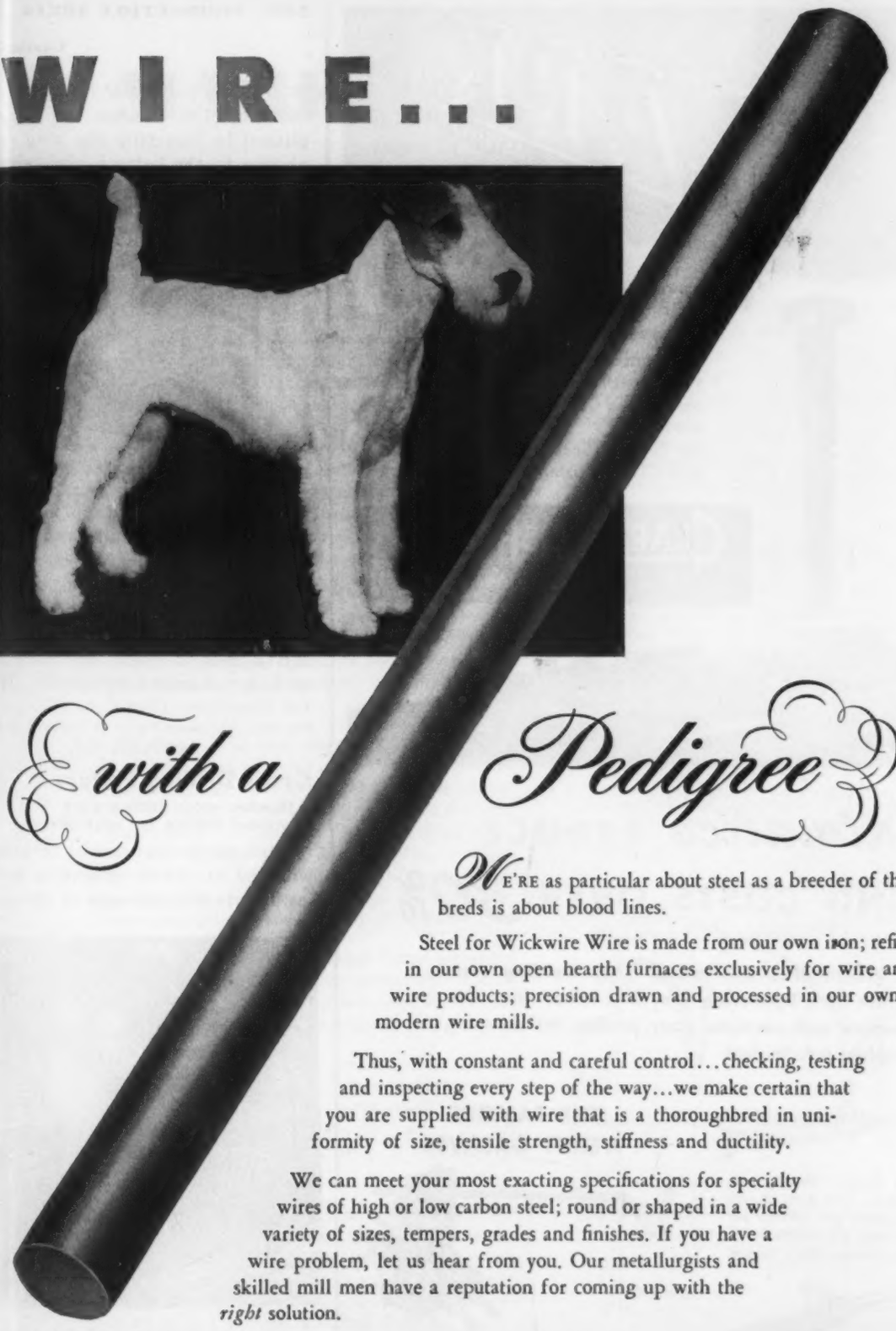
For more data insert No. 32 on postcard, p. 35.

Truck Battery Charger

Six-cell lead-acid batteries can be charged in 8 hr or less.

A new single circuit charger, Model 669-6-1 is built as an integral

WIRE...



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Steel for Wickwire Wire is made from our own iron; refined in our own open hearth furnaces exclusively for wire and wire products; precision drawn and processed in our own modern wire mills.

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Weldimatic Welding Torch "W-46", with built-in automatic Gasaver. Time study in auto plants showed an average gas savings per man of $4.80 per day with this Weldit Torch. Weighs only 13 ounces. No operator's fatigue.

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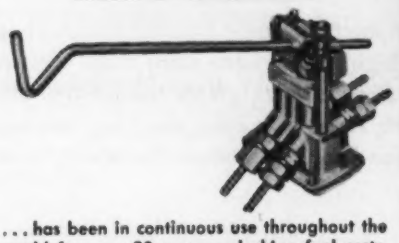

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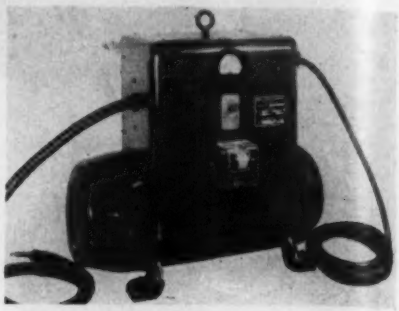
unit and is automatic in operation. Starting the charge is accomplished by inserting the plug connection to the battery and setting the time clock switch to charge



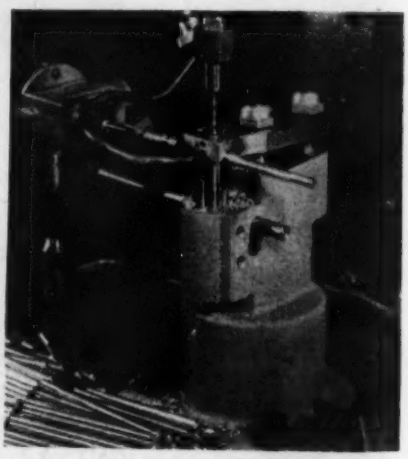
position. At the end of the time period, the set is shut down automatically; the ac disconnected from the time block; and the battery charging circuit opened. A 10-ft 3-conductor power cable with lugs and a 6-ft 2-conductor charging cable are standard equipment. *Motor Generator Corp.*

For more data insert No. 33 on postcard, p. 35.

Cross Drilling Fixture

Handles cross drilling work without tooling for each job.

High production can be obtained with the No. 4 universal cross drilling fixture through ease of change-



over, setup, loading and unloading. The unit handles drill sizes (bushing range) No. 54 through ¼ in; parts with 7/32 through ½ in. OD; and any length. A spring kick-out automatically ejects the part after the drilling operation. *Snow Mfg. Co.*

For more data insert No. 34 on postcard, p. 35.

Resume Your Reading on Page 39

Briefs and Bulletins

stainless steel—Increases in stainless steel prices, effective July 5, were made by Allegheny Ludlum Steel Corp. on both nickel-chrome and straight chrome grades. They were: all semi-finished except hot rolled strip, 1c per lb; hot rolled strip 1.25c per lb; all other products, except plates and castings, which were unchanged, 1.50c per lb. Effective July 3, Firth-Sterling increased stainless billets 1c per lb and all other stainless products, 1.50c per lb. Effective July 7, Crucible Steel Co. raised stainless steel hot rolled strip 1.25c per lb and all other products 1.50c per lb. Plate prices remained unchanged. Effective July 11, Republic Steel Corp. has raised prices of its various forms of stainless steel from 1 to 1.50c a lb.

at the warehouses—U. S. Steel Corp. warehouses increased prices of stainless steel sheets and bars 1.50c per lb, effective July 5. Ryerson warehouses boosted prices in accordance with increases announced by its supplier, Allegheny Ludlum.

pig iron shortage—Pig iron users are looking forward to a resumption of operations of two merchant blast furnaces in the Pittsburgh district and a resultant easing of the pig iron shortage here that has contributed to advances in scrap prices. Pittsburgh Coke Chemical Co.'s furnace, down for relining since May 15, is scheduled for relighting about July 15 and Shenango Furnace Co.'s furnace, out of production since May 30, is tentatively slated to resume production between July 15 to 30.

change in galvanized—Armco Steel Corp. advanced the price of its Zinc Grip-Paint Grip galvanized sheets, effective July 1. Gages 19 to 22 were increased $2 per ton, while gages 23 and lighter were advanced $4 per ton. Heavier gages were left unchanged.

appliances—The household appliance industry presents a confusing picture. While some manufacturers are cutting back production, others are increasing it. Of five leading refrigerator manufacturers, three are reported going ahead at a high rate.

alloy increase—Price increases ranging from $2 to $20 per ton on nickel-bearing alloy steel products were announced by Timken Roller Bearing Co. Bearing tube prices were increased $3 to $8 per ton effective July 7. Commercial and mechanical tubing were advanced $3 to $20 per ton, and bars $2 to $14 per ton, effective July 1.

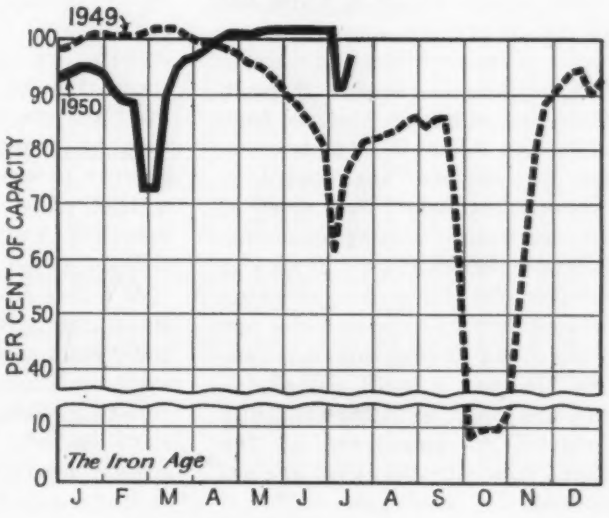
nickel, nickel—Voluntary allocation of nickel has focused attention of stainless steel producers on their scrap return programs. Stainless scrap is now selling for about $130 per gross ton delivered Chicago. The high cost of stainless makes it necessary for the consumer to use every bit of it he can. Also, most small shops using stainless don't have facilities for storing, packaging and shipping it back to the mill. Only a large stainless fabricator can afford to accumulate carload shipments. Thus dealers are still the best source.

tax dodge blocked—It's illegal to try to dodge the Federal transportation tax on property by paying freight bills in Canada. The Treasury Dept. has ruled that the 3 pct tax applies to all movements of freight between two points in the U. S., and no shipper or carrier is excused from the tax by paying freight bills outside the U. S.

nickel alloys—Price rises of 4¼ to 6¼c per lb on high nickel alloy steels of its Lockport, N. Y., plant were announced by the Simmonds Saw and Steel Co. The increases were attributed to the recent nickel price boost.

wrought iron pipe—A. M. Byers Co., increased the price of its wrought iron galvanized pipe $6 per ton, effective June 22.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 2	98.0*	99.5*	88.0	75.0	52.0	104.0	92.0	104.0	108.0*	101.2*	64.5	85.0	40.0	93.0*
July 9	100.0	101.0	94.0	88.0	54.5	104.0	104.0	104.0	107.0	102.3	68.0	84.4	44.0	96.5

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

Korean war damps down price spiral . . . Small arrivals and vacations may hold copper down . . . Zinc buyers pay premiums . . . Tin market active, on way up.

by JOHN ANTHONY

New York—The principal effect on metals of the war in Korea has been to damp down the upward surge of prices, except in the case of tin. The underlying strength of the copper and zinc markets remains unchanged, but the immediate threat of higher prices seems to be less than a few weeks ago. But the prospect of higher prices for copper and zinc cannot be ruled out completely.

Delivered Price A Factor

The recent strike in Chile has served to prevent any heavy arrivals of copper from that country for the next few weeks at least. Only one shipload arrived from Chile last week. It is understood that the copper was placed in bonded warehouse. With many of the fabricators closing down for vacation periods in July, it may be possible for them to get along without foreign copper for a few weeks. And by that time it is conceivable that a tariff suspension measure might be rushed through Congress to take care of the wholly new situation that has developed.

The establishment of a delivered price system for copper by Kennecott Copper Corp. last week was another factor that had an important effect on the market. Until other producers follow suit, many of Kennecott's customers will have an advantage over their competitors. So it will be that much less popular to initiate an upward price move, unless there are strong grounds for it.

Copper and brass scrap is flowing freely now. Payments of above market prices are no longer being reported. Smelters and ingot makers are able to get all the scrap they can make use of. In the East, the easier scrap market may be overemphasized by the absence of one refinery from the market. The Carteret, N, J. refinery of American Metal Co. is still on strike.

At a time of especially heavy demand the zinc market has been badly handicapped by strikes. Last week the Utah properties of U. S. Smelting, Refining & Mining Co. went on strike. The Midvale smelter produces about 2300 tons of zinc a month. The switchmen's strike on Midwestern railroads stopped shipments of High Grade out of Anaconda's Great Falls, Mont., refinery.

The zinc market is so tight that some consumers are paying a premium for foreign zinc. And demand from abroad is quite active. The former ½¢ spread, Gulf Ports, has been narrowed to ¼¢, bringing the price for Prime Western to 14¾¢.

To Avoid Controls

Competition from other metals is a potent factor in the resistance of copper and zinc producers to further increases in price. Fabricators are insistent that further rises in mill products prices will be at the expense of volume. But now there is the added incentive of avoiding any step that would bring about price or control.

The lead market is statistically very weak. Volume is disappointing to producers. Hand-to-mouth buying, heavy imports and the end of stockpiling have weakened the market. But in some quarters there is a feeling that lead is beginning to stabilize at the 11¢ level.

Tin trading has been much more active since the beginning of war in the Far East. At the end of the week the quotation for prompt tin reached 81¼¢, up 2⅝¢ in a week.

The June monthly average price for Lake copper quoted last week was in error. The correct figure should be 22.394¢.

NONFERROUS METALS PRICES

	July 5	July 6	July 7	July 8	July 10	July 11
Copper, electro, Conn.	22.50	22.50	22.50	22.50	22.50	22.50
Copper, Lake, Conn.	22.625	22.625	22.625	22.625	22.625	22.625
Tin, Straits, New York	79.75	80.50	81.375	....	82.75	84.625*
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	10.80	10.80	10.80	10.80	10.80	10.80

Note: Quotations are going prices.
*Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.3¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢; 4S, 61S-O, 34.0¢; 52S 36.7¢ 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48.1¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 24.8¢ 4S-F, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to $1.08; 35 to 37, 43.3¢ to $1.66.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 24.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, ⅛ to 11/32 in., 49.5¢ to 38.5¢; ⅜ to 1½ in., 33¢ to 36¢; 1 9/16 to 3 in., 36¢ to 33¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T-6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1¼ to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.3¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in, per sheet, 72 in., $1.008; 96 in., $1.344; 120 in., $1.679; 144 in., $2.017. Gage 0.024 in. x 28 in., 72 in., $1.224; 96 in., $1.633; 120 in., $2.042; 144 in., $2.451. **Coiled Sheet:** 0.019 in. x 28 in., 24.7¢ per lb; 0.024 in. x 28 in., 23.7¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 58¢ to 60¢; 0.0188 in., 60¢ to 62¢; B&S gage 8, 62¢ to 64¢; 10, 63¢ to 65¢; 12, 67¢ to 69¢; 14, 73¢ to 78¢; 16, 80¢ to 85¢; 18, 88¢ to 93¢; 20, $1.00 to $1.05; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, FS, diam in., ¼ in. to 0.311, 66¢; ½ in. to ¾, 50¢; 1¼ to 1.749, 47¢; 2½ to 5 in., 45¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ⅞ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, FS, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 59.5¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 55¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 50.5¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 47.5¢; 4 to 6 lb per ft, per. up to 28 in. 46.5¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, FS, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ¾, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	51
Angles, hot-rolled	65	51
Plates	67	52
Seamless tubes	98	86
Shot and blocks		46

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	37.43	....	37.03
Copper, h-r	....	33.28	....
Copper, drawn	....	34.53	....
Low brass	35.52	35.21	....
Yellow brass	34.19	33.88	....
Red brass	35.96	35.65	....
Naval brass	38.90	32.96	34.22
Leaded brass	....	28.54	32.65
Com'l bronze	36.93	36.62	....
Manganese bronze	42.40	36.27	37.85
Phosphor bronze	55.11	55.36	....
Muntz metal	37.13	32.69	34.94
Everdur, Herculoy, Olympic, etc.	42.05	40.99	....
Nickel silver 10 pct	45.48	47.74	....
Arch. bronze	....	....	32.65

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	17.50
Aluminum pig	16.50
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$56.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.15
Cobalt, 97-99% (per lb)	$1.30 to $1.37
Copper, electro, Conn. Valley	22.50
Copper, Lake, Conn. Valley	22.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100
Lead, St. Louis	10.80
Lead, New York	11.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	21.50
Magnesium, sticks, 100 to 500 lb	37.50¢ to 39.50¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $71
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	72.75
Tin, New York	84.625
Zinc, East St. Louis	15.00
Zinc, New York	15.72
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	21.75-22.00
No. 120	21.25-21.50
No. 123	20.75-21.00
80-10-10 ingot	
No. 305	25.50
No. 315	23.50
88-10-2 ingot	
No. 210	31.50
No. 215	29.00
No. 245	23.75-24.75
Yellow ingot	
No. 405	18.25-19.00
Manganese bronze	
No. 421	23.50

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.00-20.25
0.60 copper, max.	19.75-20.25
Piston alloys (No. 122 type)	18.50-19.00
No. 12 alum. (No. 2 grade)	17.75-18.25
108 alloy	18.50-19.00
195 alloy	19.50-20.00
13 alloy	20.00-20.25
AXS-679	18.50-19.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	19.25-19.50
Grade 2—92-95%	18.25-18.50
Grade 3—90-92%	17.25-17.50
Grade 4—85-90%	16.75-17.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33¾
Rolled, oval, straight, delivered	36.59
Forged ball anodes	41
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	23
Ball anodes	22
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.30
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	10¾
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	19½	18¾
Yellow brass	16¾	16
Red brass	18⅛	17⅜
Commercial bronze	18⅜	17⅝
Manganese bronze	16¼	15⅝
Leaded brass rod ends	16½	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25-19.50
No. 2 copper wire	18.25-18.50
Light copper	17.25-17.50
Refinery brass	17.75-18.00*
Radiators	13.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	19.25
No. 2 copper wire	18.25
Light copper	17.25
No. 1 composition	15.50-16.00
No. 1 comp turnings	15.00-15.50
Rolled brass	13.50
Brass pipe	15.00
Radiators	13.00-13.25
Heavy yellow brass	11.75-12.00
Aluminum	
Mixed old cast	10.00-10.25
Mixed old clips	10.75-11.00
Mixed turnings, dry	10.00-10.25
Pots and pans	10.00-10.25
Low copper	11.75-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	16¾—17
No. 2 heavy copper and wire	15¾—16
Light copper	14¾—15
Auto radiators (unsweated)	11⅛—11½
No. 1 composition	14 —14¼
No. 1 composition turnings	13½—13¾
Clean red car boxes	12¾—13
Cocks and faucets	12¾—13
Mixed heavy yellow brass	9½— 9¾
Old rolled brass	10½—10¾
Brass pipe	12¼—12¾
New soft brass clippings	14⅛—14½
Brass rod ends	12¼—12½
No. 1 brass rod turnings	12 —12¼
Aluminum	
Alum. pistons and struts	6 — 6½
Aluminum crankcases	8½— 9
2S aluminum clippings	11½—12
Old sheet and utensils	8½— 9
Borings and turnings	5½
Misc. cast aluminum	8½— 9
Dural clips (24S)	8½— 9
Zinc	
New zinc clippings	10 —10¼
Old zinc	7¾— 8
Zinc routings	5¼— 5½
Old die cast scrap	5½— 5¾
Nickel and Monel	
Pure nickel clippings	36 —39
Clean nickel turnings	32 —35
Nickel anodes	36 —39
Nickel rod ends	36 —39
New Monel clippings	15 —19
Clean Monel turnings	10 —14
Old sheet Monel	14 —18
Inconel clippings	22 —26
Nickel silver clippings, mixed	9 —10
Nickel silver turnings, mixed	6 — 7
Lead	
Soft scrap, lead	8¾— 9
Battery plates (dry)	4½— 4¾
Magnesium	
Segregated solids	9 —10
Castings	5½— 6½
Miscellaneous	
Block tin	62 —64
No. 1 pewter	41 —43
No. 1 auto babbitt	37 —39
Mixed common babbitt	8¾— 9
Solder joints	12 —12½
Siphon tops	37 —39
Small foundry type	12 —12½
Monotype	11 —11½
Lino. and stereotype	10 —10½
Electrotype	8¾— 9
New type shell cuttings	15 —15¼
Hand picked type shells	6 — 6½
Lino. and stereo. dross	4¼— 4¾
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

See New Buying as Pittsburgh Tie-up Eases

While there is no new buying by Pittsburgh mills, the freight pile-up there is lessening to some extent and the feeling in the scrap trade is that orders will start coming at the end of this week or the beginning of next.

There is also a feeling that prices will stabilize in the near future because steel interests are reluctant to see scrap hit a low level with the hustle to cover that usually accompanies such a steel decline. Prices on openhearth grades remained steady in most markets this week.

No. 1 steel scrap, however, was down in the following markets: Philadelphia, $1.00; Detroit, $2.00; Cleveland, $1.50; and Youngstown, 50¢.

PITTSBURGH—The delivered price paid by a district mill for a small tonnage of No. 1 heavy melting steel confirmed the existing quotation of $42.00 top. While the freight jam at the mills caused by a flood of deliveries on old orders was easing, consumers largely remained out of the market. No. 2 bundles quotation in the July 6 issue was in error, the price should have been $33.50 to $34.00, unchanged from previous week. Machine shop turnings were off $1.00, short turnings declined 50¢. On the latest railroad list, No. 1 RR heavy melting went for a delivered price of $43.50. Short rails were off $1.00, railroad specialties $2.00.

CHICAGO—Prices are holding fairly steady, although a few items were off as much as 50¢ a ton. As was expected a local mill entered the market early this week and bought No. 1 heavy melting steel at $37.50, No. 2 heavy melting steel at $35.50 and No. 2 dealers bundles at $30.00. A small tonnage of No. 2 heavy melting was bought for $34.00 last week. However, the purchase had no significant effect on the market. There is little demand for No. 2 bundles.

PHILADELPHIA—New business was placed in steel grades here last week, bringing down the price of No. 1 melting by $1.00 to $1.50. No. 2 was down 50¢, and bundles were down $1.00. Machine shop and shoveling turnings eased off $1.00. Low phos grades were also down $1.00. Weakness developed in cast grades, which were down by $1.00. Bundle orders are scarce, buyers taking 2 tons of steel for 1 ton of bundles.

NEW YORK—The market here is still pretty much at a standstill. There is some scrap moving to eastern Pennsylvania mills but none to Pittsburgh, although it is expected that buying from that city will begin shortly. Brokers are standing by waiting for that and the normalcy it is expected to bring to the local market. Prices remain unchanged in the meantime.

DETROIT—Scrap prices are down here this week but reports that the market may be preparing to firm up slightly are more persistent than at any time in the past few weeks. While sales have been few and far between, the feeling has been expressed in some quarters that steel interests are not prepared to see scrap prices hit rock bottom again and then watch the usual scramble to cover that generally follows such a steel decline. With the exception of shoveling turnings and cast iron borings, all prices reported here this week are off $1.00 to $2.00.

CLEVELAND—Purchase of a representative tonnage of No. 1 heavy melting steel at $41.00 by a Valley consumer over the weekend may have marked the end of a so-called correction period for the market here and in the Valley. Underneath the market is very strong and scrap will probably dry up from now on as there is no surplus of top grade material at quoted prices. Buyers and brokers are moving cautiously perhaps in anticipation of another possible rise in the latter part of August. Foundry grades have tightened up.

ST. LOUIS—A mill's purchase of No. 2 heavy melting steel at the present market price kept that item unchanged here although bundled sheets and turnings were off as a result of cessation of outside buying. The movement of scrap iron to the district has tapered off. Hot weather was one cause and holding for higher prices another. The Korean situation has not affected this market.

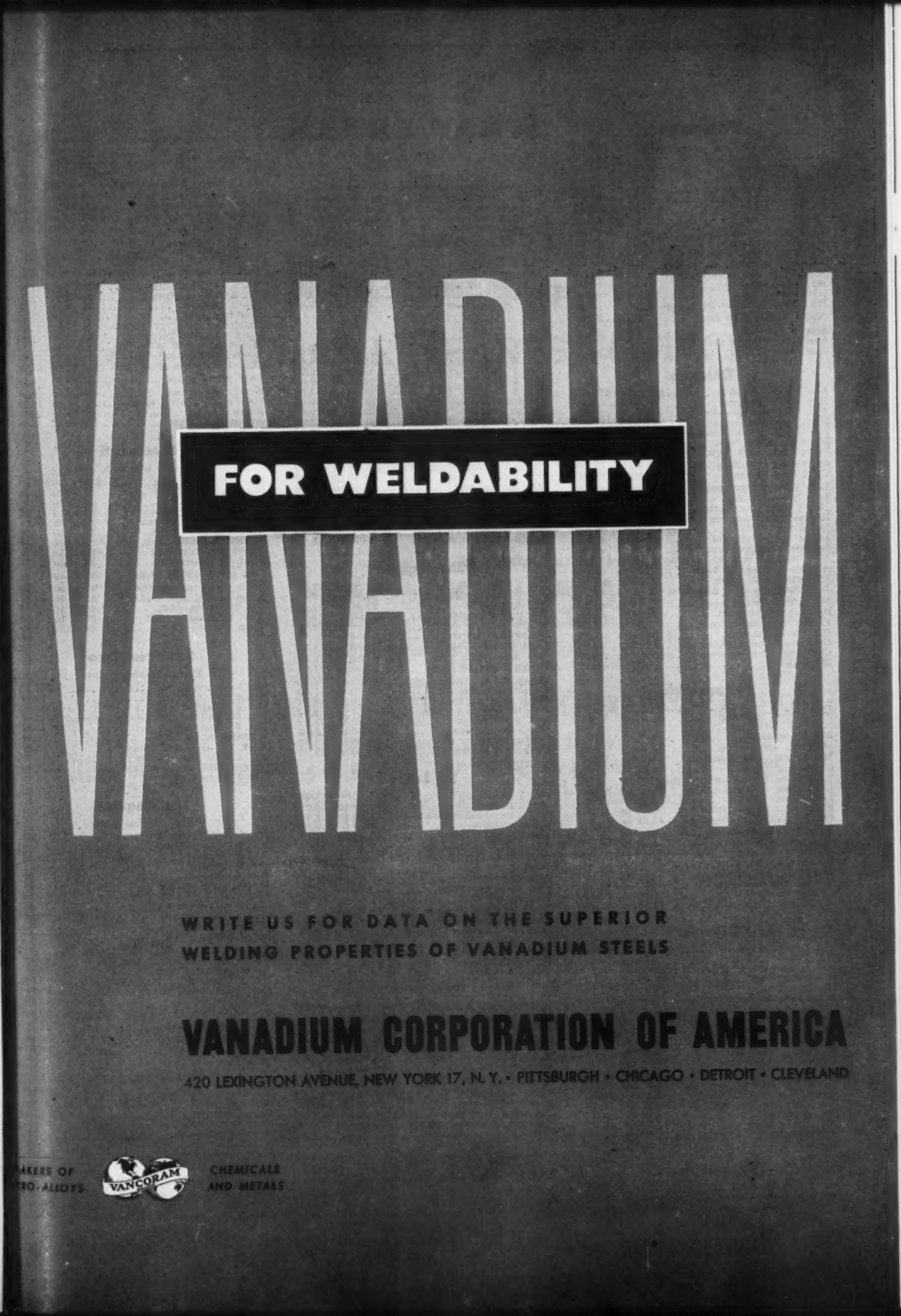
CINCINNATI—With most openhearth grades showing signs of weakness, demand for No. 1 heavy melting steel here was making it hard to buy. Most district consumers are temporarily out of the market and the market is in its usual interim period while plants are on vacation. Demand for foundry grades, however, has picked up.

BOSTON—Price revisions in the Boston market this week were only readjustments as scrap continues to seek a stable level. The dullness here has been increased by reports of a dropping off of activity due to the start of the vacation season. Because of the slowness, price spreads on steel grades have narrowed still more.

BIRMINGHAM—Scrap material prices quoted by local dealers remain unchanged, with few orders coming in. However, a sale today by one broker of a limited quantity of No. 1 and No. 2 heavy melting to Atlantic Steel for $27.00 may presage a price reduction. While little scrap is moving in this area there have been no cancellations of orders by mills such as reported in some other districts.

BUFFALO—Weaker tendencies gripped the market this week as leading mill consumers showed no interest in doing business at present ranges. Prices leaned to the down side as one leading mill was reported closing bickering for a substantial tonnage at prices running about $2.00 lower. Dealers were reluctantly accepting. Concern was expressed over the possibility of coverage in view of the uncertainty in the Korean war.

WEST COAST—Because one large buyer refused to lower its offering price for steelmaking grades of scrap, the Los Angeles and San Francisco markets did not drop last week as reported. Several prices quoted in THE IRON AGE last week were incorrect. The prices shown in this issue also prevailed last week.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Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$41.50 to $42.00
No. 2 hvy. melting	33.50 to 34.00
No. 1 bundles	41.50 to 42.00
No. 2 bundles	33.50 to 34.00
Machine shop turn.	27.50 to 28.00
Mixed bor. and ms. turns.	27.50 to 28.00
Shoveling turnings	33.50 to 34.00
Cast iron borings	32.50 to 33.00
Low phos. plate	44.50 to 45.00
Heavy turnings	38.50 to 39.00
No. 1 RR. hvy. melting	43.00 to 43.50
Scrap rails, random lgth.	43.50 to 44.00
Rails 2 ft and under	46.00 to 47.00
RR. steel wheels	45.50 to 46.00
RR. spring steel	45.50 to 46.00
RR. couplers and knuckles	45.50 to 46.00
No. 1 machinery cast	43.50 to 44.00
Mixed yard cast.	38.00 to 38.50
Heavy breakable cast.	33.50 to 34.00
Malleable	43.00 to 44.00

Chicago

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	34.50 to 35.50
No. 1 factory bundles	36.50 to 37.50
No. 1 dealers' bundles	36.50 to 37.50
No. 2 dealers' bundles	29.00 to 30.00
Machine shop turn.	24.50 to 25.50
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	42.50 to 43.50
Low phos. plate	40.50 to 41.50
No. 1 RR. hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	47.00 to 48.00
Rails 2 ft and under	47.50 to 48.50
Locomotive tires, cut	44.00 to 45.00
Cut bolsters & side frames	41.00 to 42.00
Angles and splice bars	45.00 to 46.00
RR. steel car axles	57.00 to 58.00
RR. couplers and knuckles	43.50 to 44.50
No. 1 machinery cast.	45.00 to 46.00
No. 1 agricul. cast.	43.00 to 44.00
Heavy breakable cast.	37.00 to 38.00
RR. grate bars	36.00 to 37.00
Cast iron brake shoes	36.00 to 37.00
Cast iron car wheels	41.50 to 42.50
Malleable	47.00 to 48.00

Philadelphia

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	32.00 to 33.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Low phos. punchings, plate	36.00 to 37.00
Low phos. 5 ft and under	36.00 to 37.00
Low phos. bundles	33.00 to 34.00
Hvy. axle forge turn.	32.00 to 33.00
Clean cast chem. borings	33.00 to 34.00
RR. steel wheels	38.00 to 39.00
RR. spring steel	38.00 to 39.00
Rails 18 in. and under	41.00 to 42.00
No. 1 machinery cast	38.00 to 39.00
Mixed yard cast	32.00 to 33.00
Heavy breakable cast	34.00 to 35.00
Cast iron carwheels	39.00 to 40.00
Malleable	41.00 to 42.00

Cleveland

No. 1 hvy. melting	$38.00 to $38.50
No. 2 hvy. melting	33.00 to 33.50
No. 1 busheling	38.00 to 38.50
No. 1 bundles	39.50 to 40.00
No. 2 bundles	28.00 to 28.50
Machine shop turn.	24.00 to 24.50
Mixed bor. and turn.	27.00 to 27.50
Shoveling turnings	27.00 to 27.50
Cast iron borings	27.00 to 27.50
Low phos. 2 ft and under	40.00 to 40.50
Steel axle turn.	38.00 to 38.50
Drop forge flashings	38.00 to 38.50
No. 1 RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	48.00 to 49.00
Rails 18 in. and under	49.00 to 50.00
No. 1 machinery cast.	46.00 to 47.00
RR. cast.	46.00 to 47.00
RR. grate bars	34.00 to 35.00
Stove plate	38.00 to 39.00
Malleable	47.00 to 48.00

Youngstown

No. 1 hvy. melting	$40.50 to $41.00
No. 2 hvy. melting	35.50 to 36.00
No. 1 bundles	40.50 to 41.00
No. 2 bundles	$31.50 to $32.00
Machine shop turn.	31.50 to 32.00
Shoveling turnings	33.50 to 34.00
Cast iron borings	33.50 to 34.00
Low phos. plate	42.50 to 43.00

Buffalo

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	33.50 to 34.50
No. 1 busheling	35.00 to 36.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	31.50 to 32.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	29.00 to 30.00
Low phos. plate	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	45.00 to 47.00
RR. steel wheels	42.00 to 43.00
RR. spring steel	42.00 to 43.00
RR. couplers and knuckles	42.00 to 43.00
No. 1 machinery cast.	37.00 to 38.00
No. 1 cupola cast.	34.00 to 35.00
Stove plate	36.00 to 37.00
Small Indus. malleable	37.00 to 38.00

Birmingham

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	37.00 to 38.00
Structural and plate	36.00 to 37.00
Scrap rails, random lgth.	35.00 to 36.00
Rerolling rails	44.00 to 45.00
Rails 2 ft and under	44.00 to 45.00
Angles & splice bars	40.00 to 41.00
Std. steel axles	34.00 to 35.00
No. 1 cupola cast.	38.00 to 39.00
Stove plate	33.00 to 34.00
Cast iron carwheels	33.00 to 34.00

St. Louis

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	32.00 to 33.00
No. 2 bundled sheets	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	22.00 to 23.00
Rails, random lengths	39.00 to 40.00
Rails 3 ft and under	45.00 to 46.00
Locomotive tires, uncut	39.00 to 40.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	52.00 to 53.00
RR. spring steel	41.00 to 42.00
No. 1 machinery cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Cast iron brake shoes	36.00 to 38.00
Stove plate	34.00 to 35.00
Cast iron car wheels	39.00 to 40.00
Malleable	44.00 to 45.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.50 to $31.00
No. 2 hvy. melting	26.50 to 27.00
No. 2 bundles	24.50 to 25.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	20.50 to 21.00
Clean cast chem. bor.	28.00 to 29.00
No. 1 machinery cast.	31.00 to 32.00
Mixed yard cast.	29.00 to 29.50
Charging box cast.	29.00 to 29.50
Heavy breakable cast.	29.50 to 30.00
Unstrp. motor blocks	22.00 to 22.50

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.50 to $29.00
No. 2 hvy. melting	24.00 to 24.50
No. 1 bundles	28.50 to 29.00
No. 2 bundles	$22.50 to $23.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
No. 1 busheling	28.00 to 29.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	30.00 to 31.00
No. 2 machinery cast	28.00 to 29.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	35.50 to 36.50
New busheling	33.50 to 34.50
Flashings	30.00 to 31.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. plate	33.50 to 34.50
No. 1 cupola cast.	38.00 to 40.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	33.00 to 34.00
Automotive cast.	42.00 to 43.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$36.50 to $37.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	36.50 to 37.00
No. 2 bundles, black	26.50 to 27.00
No. 2 bundles, mixed	25.50 to 26.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low phos. 18 in. under	46.00 to 47.00
Rails, random lengths	41.50 to 42.00
Rails, 18 in. and under	49.00 to 50.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	35.50 to 36.00
Drop broken cast.	48.00 to 49.00

San Francisco

F.o.b. shipping point:

No. 1 hvy. melting	$22.00
No. 2 hvy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	22.00
Scrap rails, random lgth.	22.00
No. 1 cupola cast.	$32.50 to 34.00

Los Angeles

F.o.b. shipping point:

No. 1 hvy. melting	$22.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	9.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	22.00
No. 1 cupola cast.	$37.50 to 40.50

Seattle

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	20.00
No. 1 bundles	18.00
No. 2 bundles	18.00
No. 3 bundles	14.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	21.00
No. 1 cupola cast	35.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact, prep'd.	29.00
Bush., new fact, unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	40.00

For the Purchase or Sale of

Iron and Steel Scrap . . .

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Since 1889 Luria Brothers and Company, Incorporated, have maintained their leadership in the industry by keeping abreast of the most modern methods . . . by seeking out the best markets in every part of the world . . . by strategically locating their offices to best serve the interests of their customers.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Flat-Rolled Steel: (cents per pound)	July 11, 1950	July 4, 1950	June 13, 1950	July 12, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plate	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Pig Iron: (per gross ton)	July 11, 1950	July 4, 1950	June 13, 1950	July 12, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	45.47
No. 2, Birmingham	42.38	42.38	42.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.74
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)	July 11, 1950	July 4, 1950	June 13, 1950	July 12, 1949
Heavy melt'g steel, P'gh.	$41.75	$41.75	$44.75	$20.75
Heavy melt'g steel, Phila.	*32.50*	33.75	34.50	17.50
Heavy melt'g steel, Ch'go	*37.00*	37.50	39.50	19.75
No. 1 hy. com. sh't, Det.	*36.00*	37.50	39.50	12.75
Low phos Young'n	*42.75*	44.25	45.25	21.25
No. 1 cast, Pittsburgh	43.75	43.75	43.75	26.50
No. 1 cast, Philadelphia	*38.50*	39.50	39.50	27.50
No. 1 cast, Chicago	45.50	45.50	48.50	31.00
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	22.50	22.50	22.50	17.625
Copper, Lake, Conn.	22.625	22.625	22.625	18.625
Tin, Straits, New York	84.625†	79.75*	78.00	$1.03
Zinc, East St. Louis	15.00	15.00	15.00	9.00
Lead, St. Louis	10.80	10.80	11.80	12.85
Aluminum, virgin	17.50	17.50	17.50	17.00
Nickel, electrolytic	51.22	51.22	51.22	42.93
Magnesium, ingot	21.50	21.50	21.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
July 11, 1950	3.837¢ per lb.	$46.38 per gross ton	*$37.08* per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	37.67 per gross ton
One month ago	3.837¢ per lb.	46.38 per gross ton	39.58 per gross ton
One year ago	3.705¢ per lb.	45.91 per gross ton	19.33 per gross ton

	Finished Steel Base Price — High	Finished Steel Base Price — Low	Pig Iron — High	Pig Iron — Low	Scrap Steel — High	Scrap Steel — Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.38 Feb. 7	$45.88 Jan. 3	$40.92 June 6	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07542¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

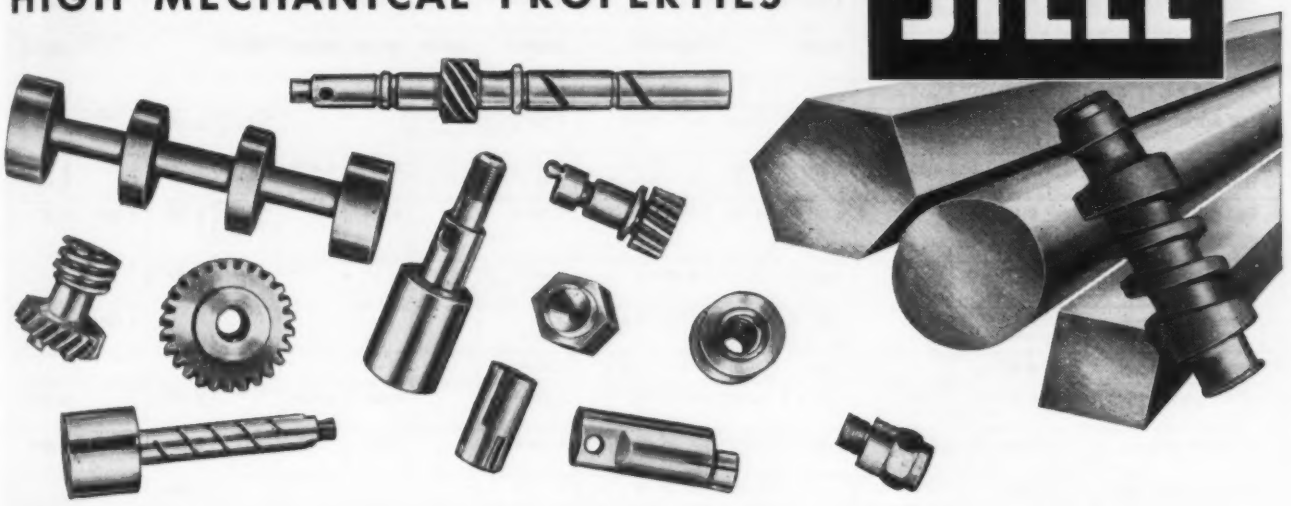
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

JALCASE 10

J&L STEEL

- - - - - - the top grade of J&L cold finished JALCASE - - - - WITH HIGH MECHANICAL PROPERTIES



. . . and all the high machinability properties of other Jalcase grades

When the shop bull-sessions get started on "better than average" steels, and the boys get down to fine points, you can be sure that Jalcase 10 (AISI No. C-1144) will come up for discussion. That's because Jalcase 10 is the grade of cold-finished Jalcase steel made for those tough and "in between" applications.

Many times finished part specifications call for a high degree of hardness—but not as high a degree as that obtained through heat treating of the finished part. In these applications, manufacturers and machinists have found it profitable to use Jalcase 10 and dispense with heat-treating processes altogether.

Machinists who know their stuff also know that Jalcase 10—the highest carbon grade of Jalcase—has high mechanical properties. They know that Jalcase is the original cold-finished, open-hearth, free-machining steel. They know that Jalcase 10 has over 25 years of research and experience behind every ton produced.

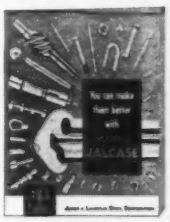
Interested in some technical data? Here are the chemical properties and mechanical properties of Jalcase 10:

CHEMICAL

Carbon Range	.40-.48
Manganese Range	1.35-1.65
Maximum Phosphorus	.045
Sulphur Range	.24

TYPICAL PHYSICAL PROPERTIES

Tensile Strength	134,050 lb./sq. in.
Yield Strength	107,840 lb./sq. in.
Elongation in 2 inches	13.5%
Reduction of Area	35.7%
Brinell Hardness	269



If you haven't tried Jalcase 10 yet (many shops have, and like it, too), why not send for our booklet entitled "You Can Make Them Better with Cold-Finished Jalcase." This 16-page illustrated booklet gives you technical information, charts and graphs about Jalcase 10 (and the other nine grades of Jalcase, too) that will help you make better parts.

Write Today!

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

☐ Please send me a copy of "You Can Make Them Better with Cold Finished Jalcase."

☐ I am interested in making a trial run on J&L Jalcase 10. Please have a representative call.

Name_____

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PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00[1]													$50.00[31]
Alloy, net ton	$51.00[1,17]													$51.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00[1]	$53.00[1]	$53.00[1]				$57.00[13]		$53.00[3]	$58.00[26]	$53.00[3]			
Carbon forging billets, net ton	$63.00[1]	$63.00[1,4]	$63.00[1,8]	$63.00[4]			$63.00[25]		$63.00[3,4]	$65.00[26]	$63.00[3]			$68.00[31]
Alloy, net ton	$66.00[1,17]	$66.00[1,4]	$66.00[1]		$66.00[4,42]		$66.00[13]	$66.00[3]	$68.00[3,4]	$68.00[26]	$68.00[3]			$66.00[31]
PIPE SKELP	3.15[1]						3.15[1,4]							
WIRE RODS	3.85[2,18]	3.85[2,4,33]	3.85[8]	3.85[2]			3.85[6]				3.85[3]	3.95[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35[1,5,9,15]	3.35[23]	3.35[1,6,8]	3.35[4,5]			3.35[1,4,6] 3.50[13]		3.35[3]	3.45[26]		3.35[3]		3.55[12] 4.15[17]
Cold-rolled	4.10[1,5,7,9,15] 5.10[63]		4.10[1,6,8]	4.10[4,15]		4.10[7]	4.10[4,6]		4.10[3]			4.10[3]	4.30[23]	4.30[12]
Galvanized (10 gage)	4.40[1,9,15]		4.40[1,8]		4.40[4]		4.65[64] 4.75[44]					4.40[3]		
Enameling (12 gage)	4.40[1]		4.40[1,8]	4.40[4]		4.40[7]	4.40[6] 4.90[76]						4.60[23]	4.70[12]
Long ternes (10 gage)	4.80[9,15]		4.80[1]			4.80[7]	4.80[64]							
Hi Str. low alloy, h.r.	5.05[1,5,9]	5.05[1]	5.05[1,6,8]	5.05[4,5]			5.05[1,4,6,13]		5.05[3]	5.05[26]		5.05[3]		5.25[12]
Hi str. low alloy, c.r.	6.20[1,5,9]		6.20[1,6,8]	6.20[4,5]			6.20[4,6,13]		6.20[3]			6.20[3]		6.40[12]
Hi str. low alloy, galv.	6.75[1]											6.75[3]		
STRIP Hot-Rolled	3.25[5,7,9,28] 3.50[41]	3.25[3,66]	3.25[1,6,8]	3.25[5]			3.25[1,4,6] 3.50[13]		3.25[3]	3.35[26]		3.25[3]		3.45[12] 4.05[17]
Cold-rolled	4.15[5,7,9] 4.50[63]	4.30[3,66]	4.30[8]	4.15[2,5]		4.15[7]	4.15[4,6,48,49] 4.50[13,40]		4.15[3]			4.15[3]		4.35[12] 4.75[58] 4.95[17]
Hi str. low alloy, h.r.	4.95[9]		4.95[1,6,8]	4.95[5]			4.95[1,4,6,13]		4.95[3]	4.95[26]		4.95[3]		5.15[12]
Hi Str. low alloy, c.r.	6.20[9]			6.20[2,5]			6.20[4,6,13]		6.40[3]			6.40[3]		6.40[12]
TINPLATE† Coke, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50[1,5,9,15]		$7.50[1,6,8]				$7.50[4]					$7.60[3]	$7.70[22]	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30[1,5,15]		5.30[1,6]				5.30[4]					5.40[3]	5.50[22]	
BARS Carbon steel	3.45[1,5,9]	3.45[1,4,23]	3.45[1,6,8]	3.45[4]	3.45[4]		3.45[1,4,6]		3.45[3,4]		3.45[3]			3.65[12]
Reinforcing‡	3.45[1,5]	3.45[4]	3.45[1,6,8]	3.45[4]			3.45[1,4,6]		3.45[3,4]		3.45[3]	3.45[3]		
Cold-finished	4.10[5] 4.15[3,4,17,53,69,71]	4.15[3,23,69,70]	4.15[4,73,74]	4.15[2,61]	4.15[4,33,82]		4.15[6,49,57]		4.15[70]					4.35[12] 4.30[64]
Alloy, hot-rolled	3.95[1,17]	3.95[1,4,23]	3.95[1,6,8]		3.95[4]		3.95[1,6,25]	3.95[3]	3.95[3,4]		3.95[3]			4.25[12]
Alloy, cold-drawn	4.90[2,17,52,69,71]	4.90[2,33,69,70]	4.90[4,73,74]	4.90[2,61]	4.90[4,43,82]		4.90[6,25,57]	4.90[3]	4.90[3,70]					5.05[64]
Hi str. low alloy, h.r.	5.20[1,5]		5.20[1,6,8]	5.20[4]			5.20[1,6]	5.20[3]	5.20[3]		5.20[3]			5.40[12]
PLATE Carbon steel	3.50[1,5]	3.50[1]	3.50[1,6,8]	3.50[4]			3.50[1,13]		3.50[3]	3.60[26]	3.50[3]	3.50[3]		3.75[12]
Floor Plates	4.55[1]	4.55	4.55[3]	4.55[5]						4.55[26]				
Alloy	4.40[1]	4.40[1]	4.40[1]				4.40[13]			4.40[26]	4.40	4.40[3]		
Hi Str. low alloy	5.35[1,5]	5.35[1]	5.35[1,8]	5.35[4,5]			5.35[6]			5.35[26]	5.35[3]	5.35[3]		5.60[12]
SHAPES, Structural	3.40[1,5,9]	3.40[1,23]	3.40[1,6,8]					3.45[3]	3.45[3]		3.45[3]			
Hi Str. low alloy	5.15[1,5]	5.15[1]	5.15[1,6,8]				5.15[6]	5.20[3]	5.20[3]		5.20[3]			
MANUFACTURERS' WIRE Bright	4.50[2,5,18]	4.50[2,4,12,35,54]		4.50[2,77]			4.50[6]	Kokomo—4.60[30]			4.50[3]	4.60[3]	Duluth—4.50[3] Pueblo—4.75[14]	
PILING, Steel Sheet	4.20[1,9]	4.20[1]							4.20[3]					

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$59.00[83]				Alloy, net ton
		$83.00[11]	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00[83]	$83.00[11]	F=$82.00[19]	Geneva=$83.00[16]	Carbon forging billets, net ton
	$74.00[83]		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25[83]	3.85[11]	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35[4,11]	SF, LA=4.05[24] F=4.25[19]	Ashland=3.35[7] Niles=3.50[64]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10[11]	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40[4,11]	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05[11]	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85[83]	3.65[83]	3.25[11]	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[2], 5.00[68] Trenton=5.00[45]	Cold-rolled
		4.95[11]	F=6.64[19]		Hi Str. low alloy, h. r.
			F=6.95[19]		Hi Str. low alloy, c. r.
		7.60[11]	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05[83]	3.85[83]	3.45[4,11]	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.80[65]	BARS Carbon steel
4.05[83]	3.85[83]	3.45[4,11]	SF, S=4.20[62] F=4.10[19]	Atlanta=3.80[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55[83]	4.35[83]		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[3]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20[11]	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90[83]	3.50[4,11]	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.85[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35[11]	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00[83]	3.80[83]	3.40[11]	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15[11]	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10[83]	4.90[83]	4.50[4,11]	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85. John A. Roebling's Sons Co., Trenton, N. J.

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	13.75	14.50	16.00	15.50	23.75	19.25	21.00	12.25	14.25	12.50
Slabs, billets, rerolling	18.00	19.25	21.25	20.25	31.25	25.50	27.75	16.60	19.50	16.25
Forg. discs, die blocks, rings	32.00	32.00	34.50	33.50	50.50	38.00	42.50	26.00	26.50	26.50
Billets, forging	25.75	25.75	27.75	27.00	40.50	30.50	34.25	21.00	21.50	21.50
Bars, wire, structurals	30.00	30.00	32.50	31.50	47.50	35.50	40.00	24.50	25.00	25.00
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	39.00	39.00	41.00	41.00	54.50	47.00	51.50	34.50	35.00	37.00
Strip, hot-rolled	25.50	27.00	31.25	29.00	47.25	35.75	40.00	22.50	29.25	23.00
Strip, cold-rolled	32.00	34.50	38.00	36.50	56.50	46.00	50.00	28.50	35.00	29.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

To dealers, f.o.b. mill	*Base Column Pittsburg, Calif.*
Standard & coated nails* 106	125§
Woven wire fence†..... 116	139
Fence posts, carloads††.. 116	...
Single loop bale ties.... 113	137
Galvanized barbed wire** 126	146
Twisted barbless wire... 126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	*Pittsburg, Calif.*
Merch. wire annealed‡	$5.35	$6.30
Merch. wire, galv.‡....	5.60	6.55
Cut nails, carloads‡‡..	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

	F.o.b. mill
Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle...	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 25¢. † Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Indiana Harbor, Ind., 79; Johnstown, Pa., 3.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	*Black*	*Galv*
⅛-in.	40½ to 38½	21 to 19
¼-in.	43½ to 41½	25 to 23
1-in.	46 to 44	28 to 26
1¼-in	46½ to 44½	28½ to 26½
1½-in.	47 to 45	29 to 27
2-in.	47½ to 45½	29½ to 27½
2½ to 3-in.	48 to 46	30 to 28
Steel, lapweld		
2-in.	38	19½
2½ to 3-in.	42	23½
3½ to 6-in.	43 to 40	24½ to 21½
Steel, seamless		
2-in.	36	17½
2½ to 3-in.	39	20½
3½ to 6-in.	41	22½
Wrought iron, buttweld		
⅛-in.	+26½	+56
¼-in.	+16½	+45
⅜ & ½-in.	+10½	+36
¾-in.	+ 4½	+32½
1-in.	+ 4	+32
Wrought iron, lapweld		
2-in.	+13½	+40
2½ to 3½-in.	+11	+35½
4-in.	+ 6	+29½
4½ to 8-in.	+ 8	+31
9 to 12-in.	+18	+40½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	21½ to 19½
¼-in.	43½ to 41½	25½ to 23½
⅜-in.	45½ to 43½	28½ to 26½
1-in.	46 to 44	29 to 27
1¼-in.	46½ to 44½	29½ to 27½
1½-in.	47 to 45	30 to 29
2-in.	47½ to 45½	30½ to 28½
2½ to 3-in.		
Steel, lapweld		
2-in.	37	19½
2½ to 3-in.	42	24½
3½ to 6-in.	44½ to 41½	27 to 24
Steel, seamless		
2-in.	35	17½
2½ to 3-in.	38	21½
3½ to 6-in.	42½	25
Wrought iron, buttweld		
½-in.	+22	+50
¾-in.	+15½	+43
1 to 2-in.	+ 5½	+32
Wrought iron, lapweld		
2-in.	+10½	+36½
2½ to 4-in.	+ 1	+25
4½ to 6-in.	+ 5	+29½
7 & 8-in.	list	+24½
9 to 12-in.	+11½	+32½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct.
* Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in In.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.15	6.39[1]	6.55[2] 6.65	5.59– 5.59[11]	....	5.40– 6.04[11]	5.69	5.59	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	6.15[7]	5.10	....	5.40	5.25	5.10	6.88	....	....	....	....
Boston	5.75	6.55[10]	6.94[8] 7.14	5.70	6.90– 6.95	6.08	5.75	5.60	6.19– 6.69	9.70– 9.87	9.50– 10.00	11.15	11.45
Buffalo	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.35
Chicago	5.15	6.20	6.65	5.10	6.80	5.40	5.25	5.10	5.85	9.25	9.55	10.70	11.00
Cincinnati*	5.42– 5.97	5.99– 6.24	6.39	5.35	....	5.79	5.64	5.35– 5.54	5.96– 6.25	9.60– 9.81	9.90– 10.11	11.05– 11.26	11.35– 11.56
Cleveland	5.15	5.95	7.00– 7.10	5.24	6.38	5.52	5.37	5.12	5.75	9.38	9.68	10.81	11.11
Detroit	5.33	6.08– 6.33	7.09	5.49	6.43– 6.80	5.59 5.79	5.64– 5.68	5.39	5.91	9.58	9.88	11.01	11.31
Houston	6.00	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35– 10.45	10.50– 10.60	11.50	11.95– 12.10
Indianapolis	....	....	....	....	7.36	....	....	....	6.15	....	....	....	....
Kansas City	5.75	6.55	7.45	5.70	6.95	6.00	5.85	5.70	6.35	9.85	10.15	11.30	11.60
Los Angeles	5.90	7.45	7.60[3]	5.95	8.35[16]	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75
Memphis	5.93	6.68	....	5.98	6.80– 6.51	6.08	5.93	5.68	6.51	....	....	....	....
Milwaukee	5.29	6.09	6.94– 6.99	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.75	....	5.55[1]	6.80	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55	6.85[1] 6.89[1]	7.20[2]	5.84	6.90[1] 6.79	5.90	5.65	5.75	6.80 6.44	9.60	9.90	11.05	11.35
Norfolk	6.10[13]	7.00	....	6.30[13]	....	6.15[13]	6.20[13]	6.15[13]	7.20[13]	....	....	....	....
Philadelphia*	5.30	6.35	6.80	5.65	6.29	5.45	5.45	5.65	6.21	9.35	9.65	10.88	11.10
Pittsburgh	5.15	6.45 5.95	6.85[2] 6.60	5.20	5.95– 6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00
Portland	6.60– 7.10[1]	8.40[3]	....	6.85[9]	....	6.40[9]	6.50	6.45– 6.45[9]	8.60[14]	12.00[15]	11.60[15]	....	....
Salt Lake City	5.85	6.70	....	7.45	8.75	6.10[3]	5.90	7.35[3]	8.75	....	....	....	....
San Francisco*	6.25[11]	7.60[3]	7.65[3]	6.75[11]	7.85[16]	6.15[11]	6.00[11]	6.15[11]	7.55	10.75	10.75	12.45	12.75
Seattle	6.60[4]	8.15[3]	8.40[3]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[15]	....	13.60[15]
St. Louis	5.48	6.28	7.18	5.43	6.68– 7.54	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.16– 6.82	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES: *(Standard unless otherwise keyed on prices.)*
Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

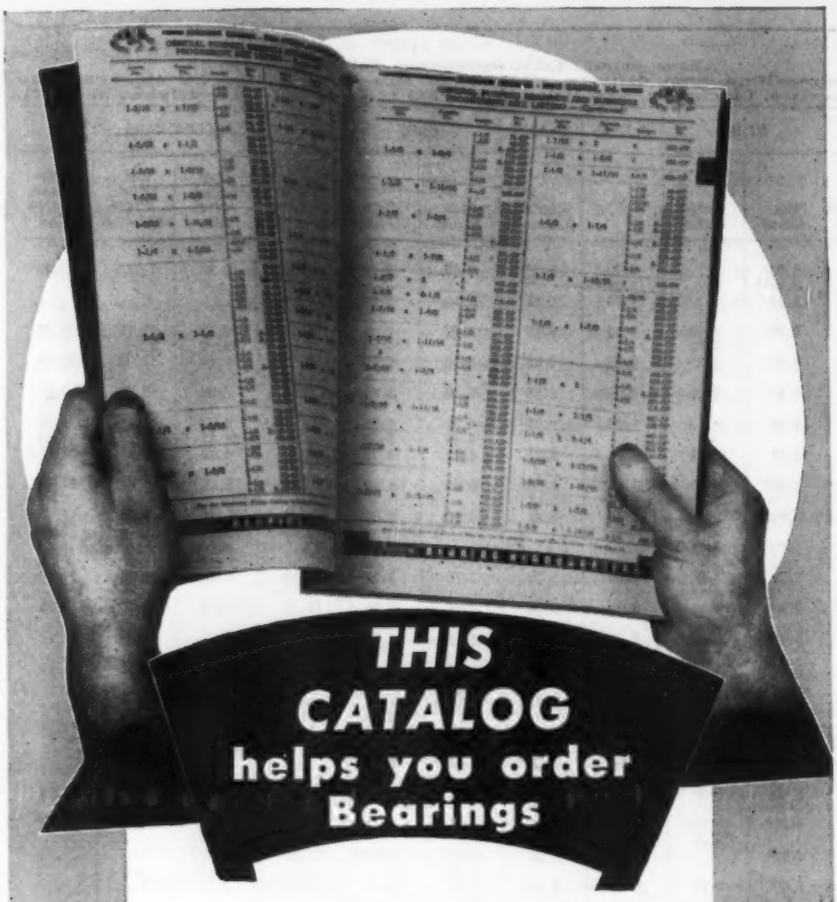
Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Birmingham	41.88	42.38	.....	.....	.....	Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Buffalo	46.00	46.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Chicago	46.00	46.50	46.50	47.00	.....	Cincinnati	Birmingham	6.70	48.58	49.08	.....	.....	.....
Cleveland	46.00	46.50	46.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Duluth	46.00	46.50	46.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	46.00	46.50	46.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	.....	50.50	51.00	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.90	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	46.00	46.50	.....	.....	.....	Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Pittsburgh	46.00	46.50	46.50	47.00	.....	Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
Geneva, Utah	46.00	46.50	.....	.....	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Steelton	46.00	46.50	49.00	49.50	54.00	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Struthers, Ohio	46.00	.....	.....	.....	.....	Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....
Swedeland	46.00	46.50	49.00	49.50	.....								
Toledo	46.00	46.50	46.50	47.00	.....								
Troy, N. Y.	46.00	46.50	49.00	.....	54.00								
Youngstown	46.00	46.50	46.50	47.00	.....								

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

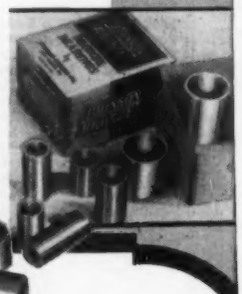
Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.



THIS CATALOG helps you order Bearings

OVER 90% of your sleeve bearing needs are listed in this Johnson Bronze catalog . . . and are stocked by your local Johnson Bronze Distributor. Keep your copy near. Refer to it when you need bearings and bushings. There are over 850 sizes of GP (General Purpose) Bearings listed by inside diameter, outside diameter, and length . . . you can order by catalog number. The same applies to over 200 sizes of Graphited Bearings, more than 300 different Electric Motor Bearings, over 350 sizes of Universal Bronze Bars, and two types of Babbitt Metal. In an emergency, look up the item you need and phone your Johnson Bronze Distributor. He has it in stock and can make immediate delivery.

If you do not have the latest Johnson Bronze Catalog, write today for your copy.



Johnson Bronze

SLEEVE BEARING HEADQUARTERS

505 SOUTH MILL STREET • NEW CASTLE, PA.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam, longer than 6 in.	22	34
Lag, all diam, longer than 6 in.	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagons or Square)

½ in. and smaller	25 37
9/16 to ⅝ in.	23 35
¾ to 1½ in. inclusive	23 35
1⅝ in. and larger	16 29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	$7.25

Small Rivets

(7/16 in. and smaller)

	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.50¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

for Distinguished Service

Choose SPEED ALLOY

Hot Rolled Alloy Steel Plate

FOR the Geneva cam in the transmission units built by R & S Machine and Manufacturing Co., Indianapolis, an easy to machine steel was required, one which would provide a hard case with a tough core. Speed Alloy was the logical choice and its performance has more than justified its selection. These Speed Alloy cams are machined as easily as ordinary machinery steel and are carburized by Motive Heat Treating Co., Indianapolis, to approximately .060 case and oil quenched to a hardness of about 58-59 Rockwell C. Core hardness averages 35 Rockwell C. Distortion in heat treating is negligible. Speed Alloy bridges the gap between carbon and tool steel . . . can be ordered torch cut to specific shape or size at less cost than competing steels . . . has "rolled-in" characteristics which make it free machining and suitable for uniform heat treatment (either carburized or direct quenched). From coast to coast it's cutting costs of machine and equipment parts where high strength and greater resistance to compression, creep and impact are important factors. Stocked in widths to 52", thicknesses to 6". Ask for Bulletin 905.

These Speed Steels will save for you, too!

SPEED CASE X 1515

A low carbon, free machining, open hearth hot rolled steel plate. Desirable carburizing qualities. 70,000 p.s.i. tensile strength and other equally advantageous properties. Smooth finishes easily obtained. Widely used for molds, gears, sprockets, fixtures, steam plates, etc.

SPEED TREAT X 1545

A medium carbon, open hearth, hot rolled steel plate—the fastest machining medium carbon steel plate. Sound, uniform hardening qualities. 90,000 p.s.i. tensile and other desired physical properties. Polishes to mirror-like finish. For molds, dies, machine ways, pressure plates, etc.

SINCE 1856

W. J. HOLLIDAY & CO. (INC.)

SPEED STEEL PLATE DIV.

138th & Sheffield Ave., Hammond, Indiana

Plants: Hammond and Indianapolis, Indiana

DISTRIBUTED BY

Brown-Wales Co. Boston - Hartford - Lewiston, Me.
Bridgeport Steel Co. Bridgeport, Conn.
Beals, McCarthy & Rogers Buffalo, N. Y.
Burger Iron Co. Akron, Ohio
Grammer, Dempsey & Hudson, Inc. Newark, N. J.
Earle M. Jorgensen Co. Los Angeles-Houston-Oakland
Passaic County Steel Service, Inc. Paterson, N. J.
Peckover's Ltd. Halifax - Montreal - Toronto - Winnipeg - Vancouver
Peninsular Steel Co. Detroit, Mich.
Pidgeon-Thomas Iron Co. Memphis, Tenn.
Horace T. Potts Co. Philadelphia - Baltimore

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.65¢
4, 5	40	20.48¢
3	40	21.53¢
2½	24, 30	22.05¢
2	24, 30	24.15¢
CARBON		
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct, Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon 10 pct, Coatsville (21)	31.00	
Inconel-carbon 10 pct, Coatesville (21)	39.00	
Monel-carbon 10 pct, Coatsville (21)	32.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, del'd	22.18
Birmingham, del'd	20.20

FLUORSPAR

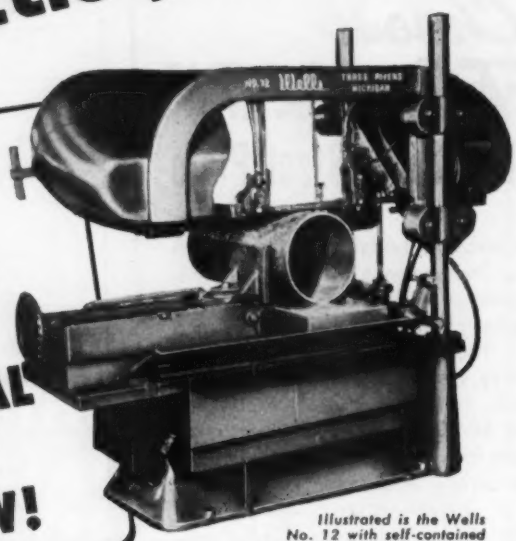
Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

Prices Continued on Page 142

BIG JOBS... or little jobs

Handle them speedily, economically on a WELLS No. 12 METAL CUTTING BAND SAW!



Illustrated is the Wells No. 12 with self-contained wet cutting system.

The Wells No. 12 Saw is a sturdy production tool for fast and accurate cutting at a minimum cost. It doesn't require an expert to operate this machine. Just place the stock in the quick-acting vise and push the starting buttons — the hydraulic head descends automatically, feeding the blade into the stock at a uniform rate, governed by electrically controlled, adjustable blade pressure. At the completion of the cut the head returns to a predetermined raised position and the motors shut off.

Get full details from your Wells dealer.

DESIGN DETAILS

CUT-OFF CAPACITY:	
Rectangular	12" x 16"
Rounds	12¾" O.D.
DIE BLOCK CAPACITY:	
Maximum Cutting	12¾" deep; 16" wide
Maximum Clearance, Bed to Blade	18"
SPEEDS, Selective	50, 90, 150 ft. per min.
MOTORS	⅓ H.P. & ¾ H.P.
WEIGHT, Approximate	1750 lbs.

Write for complete information on Wells Metal Cutting Band Saws.

Wells Saws

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
202 WASHINGTON AVE., THREE RIVERS, MICH.

REFRACTORIES

	(F.o.b. works) Carloads, Per 1000
Fire Clay Brick	
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	80.00
No. 2 Ohio	72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	14.00
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50
Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$69.00
Magnesite Brick	
Standard, Baltimore	$91.00
Chemically bonded, Baltimore	80.00
Grain Magnesite	*St. ⅜-in. grains*
Domestic, f.o.b. Baltimore, in bulk fines removed	$56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk	33.00
in sacks	38.00
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	70.0¢ to $1.35
Aluminum	29.00¢
Brass, 10 ton lots	27.75¢ to 31.25¢
Copper, electrolytic	9.25¢ plus metal value
Copper, reduced	9.75¢ plus metal value
Cadmium, 100-199 lb	$2.95
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	18.50¢
Manganese	52.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	$2.90
Zinc, 10 ton lots	20.50¢ to 23.85¢

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$91.80 to $95.30
6 to 24-in., del'd N. Y.	91.00 to 92.00
6 to 24-in., Birmingham	78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	$108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn. 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Prices Continued on Page 144

Production reports prove that Keystone's new "special processed" cold heading wire effects considerable savings in the manufacture of Phillips head, clutch head and cross recessed head screws.

The excellent flow properties of this new wire deliver the desired upsetting and die forming qualities with a high degree of uniformity. Die and plug life are often more than doubled . . . finished product rejections are minimized . . . the cost of expensive final inspection is reduced. The superior plating qualities of "special processed" wire further assure a better finished product.

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Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contrast price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

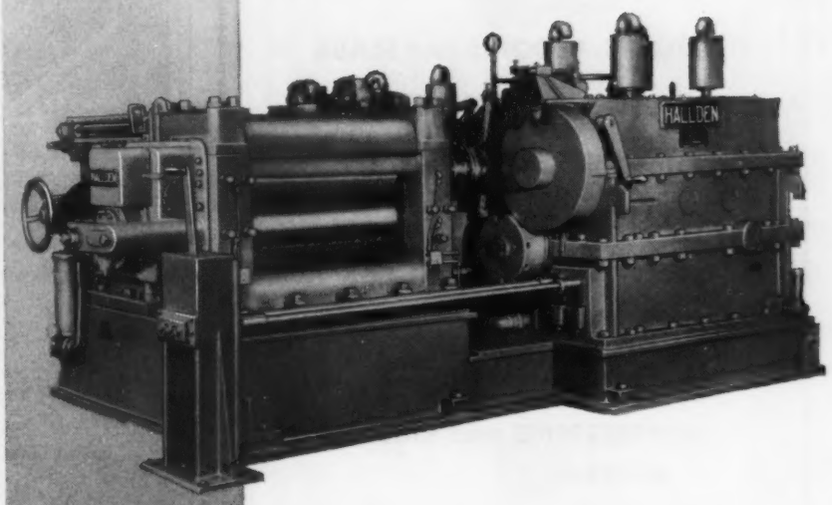
Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$3.50
Less ton lots	3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$2.67
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	$1.13
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.40
Less ton lots	$1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$167.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.46
Less ton lots	1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

HALLDEN AUTOMATIC SHEARS



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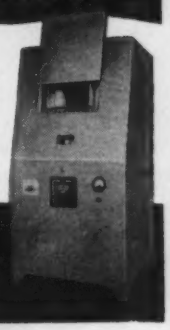

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See our Adv. on page 229 March 30 Iron Age

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5" National High Duty Upsetting & Forg. Mach. Air friction clutch; side shear; auto. lubricating system; jib crane; 60 H.P. motor; V-belt drive

3" Ajax Single Stroke Solid Die Ball Header, rated capacity 4½" balls, suspended slides, air clutch

Upsetting & Forg. Machs., National High Duty, guided overarm heading slide, suspended slides, 1½", 2", 3", 4", 5"

Ajax & Acme Upsetting & Forg. Machs., not suspended slides, ¾", 1", 1½", 2½", 3"

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Drop Hammers, 800# to 2500#

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Bradley Hammers, Cushioned Helve, Upright & Compact, up to 500#

Trimming Press, #59¼ Toledo, 385 ton; other trimmers 55 to 200-ton

L. & A. Plate Shear, Cap. 1" x 12'

Bar Shears, Open & Guillotine, ⅛" to 7" Rd.

Ferracute #6 Solid Back Geared Press, 100-ton

Minster 88-ton S.S. Press, 16" stroke

Solid Back Presses, 20 to 100-ton

#94-A Toledo S.S. Double Crank, Tie Rod Press; bolster 40x36"

Bliss Knuckle Joint Press, 250-ton

Cleveland EF Sgl. End Punch, 48" throat, 1¼" thru 1"

Single & Double End Punches, various throat depths and caps.

L. & A. Multiple Punch, 8', 150-ton

L. & A. Multiple Punch, 10', 350-ton

Ryerson Serpentine Throatless Shear, ½"

#416-C Niagara Circle & Slitting Shear, ¼"

Flanging Machine, McCabe, cap. ¾"

Bertsch Straightening Roll, 1"x68"

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American Wheelabrator, 36x42"

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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Pittsburgh Domestic Activity—Used equipment business in this area has picked up slightly during the last month. However, dealers are only mildly enthusiastic over the activity. Machine tool business is poor in comparison with the strong domestic demand for used and rebuilt mill equipment. Dealers attribute the mill equipment demand to the high level of operations in the steel industry and to installations for small processing operations, such as slitting, in local warehouses.

New York MDNA—At the recent meeting of the New York chapter of the Machinery Dealers National Assn. at Cavanagh's restaurant, the group made plans for the coming year's activities. Alfred J. Weisbecker, new chapter chairman, presided. At that time it was announced that the next meeting would be held at the Hotel Governor Clinton at 6:30 pm the last Monday in September.

Automotive Retooling — Huge new tooling programs in Detroit's automotive centers for production of high compression engines and automatic transmissions are only indirectly helping local used machinery dealers. Most equipment ordered for these jobs is new. However, it is believed that a substantial secondary demand for used equipment has been created.

Furnace Rebuilder—For the industrial users who would buy used furnaces, the Standard American Engineering Co., Lyons, Ill., a relatively new member of the family of rebuilders, is ready to supply all types and makes of industrial heat treating furnaces. They are reputed to be the only company in the country selling used furnaces with a guarantee equal to that given by the original manufacturers.

Standard American handles both batch and continuous types of the following furnaces: Hardening, tempering, carburizing, normalizing, dry cyaniding, liquid cyaniding, and others. Reconditioned and guaranteed furnaces are generally sold at from 30 to 50 pct of today's new furnace list prices. Data and reference sheets on AECO installations are available.

For more data insert No. C1 on postcard, p. 35.

Pittsburgh Foreign Activity — Although inquiries continue to come in, dealers here report that foreign activity in mill equipment is slow. Hinderances to foreign trade are the customary red tape, currency troubles, and the difficulty of visualizing a prospect's requirements without seeing the physical layout of the plant in which the equipment is to be installed. Language is not an important barrier, since most correspondence is carried on in English. So far, the international scene has had no effect on business.

Los Angeles NISA—The Los Angeles chapter of the National Industrial Service Assn. held a local meeting here recently. Ray Smallcomb, vice-chairman, introduced Mr. Rose of Smallcomb Electric Co. who spoke on the topic: "California State Board of Equalization—Problems of State Sales Taxes as Applied to Repair Work." The business meeting included a report by William M. Hogue of Larsen-Hogue Electric Co. on highlights of the 17th annual NISA Boston Convention.

Cleveland Dealer Moves—The Noll Machinery Co. of this city has announced that it will move its offices and rebuilding and storage facilities into the manufacturing buildings of the old Hill-Acme property. These buildings, located at 45th and St. Clair, feature a 60,000-sq ft manufacturing area served by a 100-ton overhead crane, and are being remodeled for the coming Noll occupancy.